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Original Contributions.

IMPROVED AMALGAM FILLINGS.

By S. B. PALMER, M. D. S., SYRACUSE, N. Y.

The November issue of the DENTAL DIGEST contains an article under the above heading, by Dr. M. L. Mannhardt, Berlin, Germany, which I think does not cover the ground intended by the writer. That is, Americans will not fully endorse the first sentence of the paper—"It is a well known fact that amalgam fillings do not prevent or arrest further decay."

I am not intending to criticise the paper, but will add to a valuable suggestion of the writer, that of lining cavities with tin under amalgam, and give scientific reasons for the benefits derived therefrom, consequently the first quotation will not be commented upon.

It is fair to state that there are two conditions of dentine, one might come under the statement, while the other would not. It is to be regretted that writers so often present but one phase of a subject.

It is well understood that the metallic salts furnished from amalgam enter into dentine, and with the organic portion of the tooth an insoluble compound lining is formed, which arrests further decay. The same principle renders tin better than gold for the teeth of children. Tin is better than amalgam because the stannic oxide is white and does not discolor dentine. Practice has taught that copper is an element in dental alloys which furnishes these properties more than silver and tin. If an amalgam could be made which would be as free from oxidation as gold, it would be no better than the latter, with any possible shrinkage against it.

Much has been written on shrinkage of amalgam. The most

the cavity-walls be lined with tin-foil, which must be pressed against them tightly, thus perfectly dressing them, then prepare the amalgam as usual and pack it in the cavity, then after some days the superfluous tin-foil can be trimmed away and the filling with its tin-foil border will take a high polish."

It is well known to our American readers that I have recommended tin linings in several papers, and will now mention the difference in practice. It is not necessary that the tin lining should overlap and be finished at another sitting for this reason, tin amalgam is weak and would give poor edge strength. The lining may be introduced so as to overlap, which is best for convenience, and I find that by the time the plug is completed the overlap comes away with the surplus material; in other words, the mercury cuts the tin at the enamel border, care is used that the tin furnishes no element of the filling at the enamel. A spoon excavator passed around the cavity will cause a slight depression to receive amalgam like the mass. The real benefits of this lining are not mentioned by the author. They are, the blending of the two elements mentioned, in all amalgams, so as to avoid chemical action upon the hidden surface of the filling. Practically and chemically the filling is one of tin amalgam, like that which is used on the back of mirrors; it does not tarnish easily, it does not disclose dentine, nor does the plug shrink.

The paper also recommends platinized gold as a lining for cavities—"When using the platinized gold it must be remembered that the overlap should be left undressed for some days." In this he is right. The lining would not be cut away with the mercury, nor would the material injure the edge strength. "After some lapse of time you will be surprised at the perfect margins, and the absence of discoloration in a tooth thus filled."

A word of caution may save some mistakes in the use of platinized lining. It should not be used where gold would not be admissible. Such fillings in effect are like gold, they do not oxidize, consequently do not offer any antiseptic properties, while the margins are bright and clear the amalgam proper will turn black, as fillings do in contact with gold. The lining, being the negative element in the plug, causes the filling to become positive.

The object of this review has been to give the readers both sides of the subject.

potent cause has generally been left out. When a filling is ready for insertion it is composed of particles, shavings or filings, which are covered with mercury and soldered together into a mass. What is known as "setting" is the penetration of the mercury into the unamalgamated particles. When this process is completed, it may be in weeks or months, there still remains in the mass distinct elements composed of the portions not fully amalgamated and that which is the amalgam proper. This taking up mercury after fillings have been completed is one cause of shrinkage. Another is chemical action between the two portions of the plug. We do not find an amalgam plug bright on the surface in contact with dentine, unless a lining has been used to exclude moisture. There is moisture sufficient in any tooth while in the mouth to set up action between the elements mentioned. Please bear in mind that in fully developed teeth, such as might be filled with gold, this dissolution on the surface does no harm, the salts arresting further action as above described.

As the dentine becomes more porous, which condition is found in molars whose pulps were devitalized before maturity, it will be found that ordinary amalgam will not furnish sufficient salts to prevent continued action upon the plug, which also re-acts upon the lime constituents of the dentine. About all the use I ever found for copper amalgam was to line cavities of this class. It is practical and efficient. For several years I have used no copper in amalgam alloy. When cases are presented where copper would be indicated, oxyphosphate linings answer a better purpose. By this I do not mean filling a considerable portion of cavity, but merely filling the dentine and soft portions that must remain. The mix must be thin, so that it would drop from the spatula. It may be introduced by cotton wound firmly upon an excavator or other suitable instrument. Introduce the filling as quickly as possible, so as to force out any excess of cement. Dry the cavity borders and fill as usual. With this lining there is no thickness of cement to wash out, nor is there space for fluid circulation to cause the chemical shrinkage mentioned. Another advantage is that it does not discolor enamel.

I will quote the keynote of the author's object in writing, "The objections to amalgam can however be overcome, and a perfect filling be inserted, if the operation be performed as I here suggest. I advise that subsequent to the preparation of the cavity

further need of the remedy; dry it out, and with more cotton on the broach saturate the canal with campho-phenique. After which I dip the cotton into aristol to make a paste and put it as far up the canal as I can, and seal up the chamber.

If the tooth does not show any signs of irritation at the apex within a week or ten days I remove the dressing, and after cleansing and treating about the same as before I proceed to fill the canal with the aristol paste and a white gutta-percha cone. Then thoroughly cleanse the pulp-chamber and fill it and the remaining space of the canal with oxyphosphate. I never use any of the essential oils or anything containing any coloring matter besides the aristol, and after years the tooth will look nearly as clear as when first filled. Never use red gutta-percha cones nor iodoform, as I have seen teeth ruined by the coloring matter in them being absorbed into the crown.

The second class of cases is often cured by one or two treatments, such as were given to the first class, but if any of the septic products have escaped through the apex and are causing incipient abscess, I proceed at once to cut or drill through the alveoli to the apex of the root and make an opening for the escape of the inflammatory products. To do this with the least amount of pain I inject into the gum, at the point where I wish to make the perforation, a solution of cocaine and atropin in carbolyzed water, and after slitting the gum down to the alveoli drill through the anterior plate, and then inject the anæsthetic into the canaliculi and tissues around the apex. This will usually cause some pain, but in a few moments you can proceed to complete the operation with comparative ease to the patient.

This treatment should be done early and before any considerable amount of inflammation has developed, otherwise it becomes a very painful operation, which no local anaesthetic will prevent, and oftentimes it is a question between extracting, perforating, or allowing it to develop into a case of the fourth class. Iodine and capsicum plasters do some good in mild cases, but serve chiefly to amuse the patient while the destructive process is going on, which will usually perforate the alveola and, after discharging for a few days, will be ready for a thorough cleansing with the H_2O_2 , followed by carbolic acid. The latter is to be pumped through the canal until it appears on the gum at the fistulous

TREATMENT AND FILLING OF PUTRESCENT PULP-CANALS.

BY L. WEST, D. D. S., MONETT, MO.

In the January DIGEST is a digest of an article by Dr. H. C. West on this subject, which article is in the main a very good dissertation on the topic; but as there are several methods of treating the various forms presented, and all more or less successful, the question naturally arises, have we yet found the best method?

The Doctor's classifications and definitions are probably sufficiently accurate for all practical purposes, but when he begins treatment of his first class he says, "Gaining access should be done with the utmost care, by application of rubber-dam and very sharp drill, being careful not to let the latter press with force enough to cause the contents of the canal to pass through the apical foramen." After having gained a partial opening into the chamber he immediately applies H_2O_2 upon a pellet of cotton by the aid of a broach, or better still the use of permanganate of potash, carried through the opening and allowed to dissolve there in the fluids.

I am unable to see what he gains or avoids by the use of the rubber-dam, unless he is afraid that some of the numerous bacteria which are always found in the secretions around the teeth will enter the pulp-chamber and disturb the hitherto peaceable occupant. Or does he apply it for the purpose of keeping the offensive contents out of the patient's mouth? What advantage is there in getting a thorough disinfection of the chamber before disturbing the contents of the canal, and how long before the H_2O_2 or permanganate will produce the desired effect?

His further treatment, slightly varied, I have found to be generally satisfactory, but I never apply the rubber-dam to such teeth, and instead of using H_2O_2 on broach first, I use it with the hypodermic syringe, wash out the contents of the canal as far as possible, and let the patient expectorate the resulting products into the spittoon. The H_2O_2 will also sweeten the breath and make the further treatment more pleasant to the operator. Then I use the H_2O_2 on cotton wound on a fine broach and pump it into the canal as far as possible until it ceases to give evidence of

opening, care being taken that it does not run over the gum, but should that happen it can instantly be neutralized with bicarbonate of soda.

I then treat the root as in the other cases, and after the inflammation has subsided it can be filled, and any further treatment can be carried on through the fistula. In the treatment of the second class, where the effusion from the inflamed tissues at the apex would flow into and fill the canal, I treat by perforating, the same as if for curing chronic blind abscess.

My reason for treating these several classes of pulpless teeth so heroically is, that a radical cure is generally effected, while if we wait and delay treatment the inflammation may extend from one to another of the canaliculi until the roots of the contiguous teeth are as badly inflamed as the pulpless one. This may result in the breaking down of a considerable portion of the process around the roots, and in some instances I have seen portions of the alveoli as large as a filbert completely disintegrated by the inflammatory process. With a clear conception of the conditions present, and with clean sharp instruments, all this pain and danger can be prevented by making an early opening into the affected parts.

But, you say, some patients will not submit to such a plan of treatment. In that case we must do the best for them that they will allow, telling them the probable results as well as the possible ones in each course of treatment. If they prefer to suffer several days and nights, instead of a few minutes, that is their choice, but we should do our duty as far as possible in each case.

Cutting off the apex of a root is not so easily accomplished as represented, and I have found it one of the most difficult parts of operative dentistry. I am never sure that I have formed the nice, smooth, ideal cone of the remaining part which we hear others speak of making. The parts must be thoroughly injected with a good local anæsthetic, and even then there is more pain than the patient will ever care to experience a second time, and, while we often effect cures, I have thought that the good results come as much from the removal of the pyogenic membrane at the apex as from the excision of the apex itself.

A PLEA FOR A GREATER USE OF NON-COHESIVE GOLD.

BY J. N. CROUSE, D. D. S., CHICAGO.

Having read various papers on the use of gold and the filling of proximal cavities, I have been alarmed at the apparent disuse of an old but very reliable method, namely, the use of non-cohesive gold in the form of tightly rolled cylinders, which is the wedge principle. These cylinders are best made from No. 3 or 4 gold foil, which should be non-cohesive. If it has any cohesiveness, that should be removed by placing the foil in a drawer with aqua ammonia for a few hours. To make the cylinders, fold the gold leaf upon itself until you have a ribbon a little wider than the depth of the cavity at the cervical margin. Having filed a broach to a triangular peak, lay it on one end of the ribbon and turn gently, when the gold will be wrapped around the broach, making cylinders a little more in width than the depth of the cavity.

These cylinders are made differently for various cases. In large cavities the first one or two may contain a sheet of No. 3 foil, the rest less; some rolled quite tightly on the broach, others less so. With a variety of cylinders thus prepared we are ready to fill well a large proportion of the cavities which occur on the proximal and buccal surfaces of bicuspid and molars, and in one-fourth the time required to make as safe a filling with cohesive gold.

About the same amount of time and painstaking effort is needed in either case to prepare the cavity, but it is shaped somewhat differently for non-cohesive gold, and especially for cylinders as described. There are no pits drilled in the dentine from which to start the filling, and the cervical walls need be but little undercut, as strength of anchorage when the cavity is completed is depended upon toward the grinding surface, this being the point where the greatest strain comes on the filling by force of mastication. The lateral walls usually have sufficient undercut when the decay is removed, or if not, slight grooves or undercuts should be made.

With the cavity prepared, and where the walls are of good strength it is a waste of time to use cohesive gold for any except

the latter part of the filling, and then only in cases where it includes part of the grinding surface, select a cylinder which when placed lengthwise will extend a little beyond the cervical margin, or in cases of large and deep cavities one large and long enough to rest against the opposing tooth and to entirely cover the cervical margin, and start your filling. In extreme cases two sheets of No. 3 made into one cylinder can be used to good advantage. Generally, however, a large cylinder on each side and a smaller one between the two makes a good foundation. Always remember at this point not to condense each cylinder separately, thus crowding them apart, but a place should be made for the next one, which should be rolled tighter and of a size that will occupy the place as a wedge. Continue until the cavity is about two-thirds full, when, if it is required, cohesive gold can be driven into and between the cylinders at different points, and then the whole mass of gold, being for the most part non-cohesive and so quite ductile, may be forced into every crevice, making a very perfect filling. On top of the cohesive gold already in the cavity we can readily add more and so continue the filling over and onto the grinding surface, contour and finish.

I leave the minute details of this old and tried method to a series of articles which I shall give later in the DIGEST, and give only what I have on the strength of this proposition,—that I can fill a class of difficult cases quite as well by this method, and in so much less time that, in justice to myself and the patient, I cannot afford to adopt the use of cohesive gold exclusively. Therefore, I make the plea for a greater use of non-cohesive gold in certain cavities.

AN ANALGESIC AND ANTISEPTIC DRESSING.—M. Delpech, of Paris, with the aid of M. Petit, has obtained an antiseptic and analgesic dressing, which he calls *la ouate picrique*. Picric acid was formerly used in the Spanish and English colonies as a febrifuge. Quite recently Dr. Thiery, *chef de clinique* of the Paris Medical Faculty, published the results of his treatment of burns with picric acid, and he noted the antiseptic and analgesic action of the acid. Dr. Delpech's *ouate picrique* is prepared as follows: Purified cotton wool is steeped in a saturated solution of picric acid; the cotton wool is then dried in a disinfecting stove; square sections of this cotton wool, steeped in water, even in cold water, immediately relieves, and in a short time entirely abolishes pain. Repeated applications of this wool, moistened, cure burns.—*Medical Record*.

NON-ERUPTION OF TEETH.

By C. FISCHER, D. D. S. ZANESVILLE, O.

The interesting article of Dr. Robinson's in the October number of the *DIGEST* calls to my mind a case which presented itself in my office several months ago. A young girl, seventeen years of age, called to have a partial plate made. On examination I found the following teeth had not erupted: in the upper jaw the two laterals, the four bicuspid and the two second molars; in the lower jaw the two second bicuspid and the second molars. The other teeth were in normal position and all the necessary spaces for the missing teeth to occupy were present. The girl had difficulty in talking properly. The question in my mind is, whether a plate which would slightly press on the alveolar ridge and cause irritation and absorption of bone, would not thus coax the missing teeth into place.

TOTAL ABSTINENCE AND LONGEVITY.—Sir George Humphry has collected information regarding 45 centenarians, of whom only 12 were total abstainers, while 30 were moderate drinkers, and 3 were heavy drinkers. Of 689 persons between eighty and one hundred years of age, as given in Sir George Humphry's tables, only a fraction over twelve per cent. were abstainers, while nearly nine per cent. were heavy drinkers.—*Medical Record*.

SCHLEICH'S METHOD OF LOCAL ANÆSTHETIZATION.—The skin is first made aseptic, then pinched up and the sterilized needle of the syringe containing the solution, which should be cold, is passed obliquely under the epidermis, and a few drops are injected until a white elevated wale appears. The needle is withdrawn and inserted at the edge of this wale and so on until an area as large as may be desired is made anæsthetic. If the spot to be cut is first cooled by an ether or rhigolene spray, if it is the skin, and by a strong solution of carbolic acid if it is the mucous membrane, the prick of the needle is not even felt, but in the case of the small needle, which should be used, the pain is almost *nil*, especially when the skin is pinched. Wurdemann has used this method in operations about the eye, and also in abscesses and felons with success. Schleich has even done cœliotomies with it, but others might not dare follow this lead. The solution most usually employed is a grain and a half of cocaine, one-third of a grain of morphine, and three grains of sodium chloride in three ounces and three drachms of sterilized water. Two other solutions, one containing double the quantity of cocaine, and the other one-tenth the amount, are also used. The value of this operation is in the technique, and stress is laid on the point that the needle must not go beneath the skin. This process is capable of development and is worthy of a careful trial.—*Maryland Medical Journal*.

Digests.

The Pacific Stomatological Gazette for March, 1896.

"DENTAL JURISPRUDENCE, EVIDENCE," by H.R.Wiley, A.B., San Francisco. The "victim of circumstances" is a person who is frequently presented to the eye of the public as a sort of living appeal for commiseration. It is undoubtedly true that men sometimes become entangled in a net-work of malignant circumstances that seem to conspire to accomplish their overthrow. It is true, also, that many men who are regarded as the unfortunate victims of malignant circumstances, are, in reality, only experiencing the inevitable results of an almost criminal neglect of simple rules of self-protection.

We have had occasion to say before, when following this same line of thought, that it is not sufficient that a man be innocent of crime, but it behooves him also, in case of prosecution, to be prepared to answer any and all legal evidence tending to prove him guilty. The evidence of the prosecution must be met with stronger evidence for the defense. The court or the jury must decide each case in accordance with the evidence produced. The simple fact that the accused is wholly innocent of the offense charged, although it sustains the heart through the most scathing persecution, is not alone sufficient to insure acquittal.

Innocence is the best foundation for a case, and where the superstructure has been once built upon that foundation there is no fear of overthrow. The main fact of innocence must be made legally apparent to a jury through the medium of evidence, since there is no direct means of baring the heart of the accused to the eyes of his judges. The law presumes "that a person is innocent of crime or wrong," and the burden of proof rests upon the prosecution. The defendant's guilt must be proven, and if the prosecution fails to make out a *prima facie* case no defense is necessary, and the accused, shielded by this benign presumption of law, is held to be "innocent of crime or wrong." If, however, a *prima facie* case be made against the accused, then will the burden of proof be shifted to the defense.

Since "the direct evidence of one witness who is entitled to full credit is sufficient for proof of any fact, except perjury and treason," it is evident that situations may arise in which a patient, by his or her unaided evidence, may make a good *prima facie* case against a dentist, and in which the dentist may have only his uncorroborated statement to offer in his defense. In such a case the jury must judge the weight of the evidence, and a slight corroborative circumstance on either side may be sufficient to turn the scale.

The case of Dr. Beale, "a highly respectable dentist of Philadelphia," is a forcible illustration of conviction upon the uncorroborated testimony of one witness. Dr. Beale was charged with rape. The prosecuting witness was a young woman of excellent reputation, to whom the Doctor had administered an anesthetic, preparatory to extracting a tooth. On the witness stand she described with much precision events alleged to have transpired while she, according to her own admission, was so far under the influence of the anesthetic as to be unable to offer any physical resistance. Dr. Beale was convicted and sentenced to four years and six months' imprisonment. This case must seriously impress those who are familiar with the usual conditions of a patient in various stages of anesthesia. Much doubt seems to exist as to the possibility of clear mental perception at the stage of physical helplessness, and erratic emotions are among the most familiar phenomena of anesthesia.

On the hypothesis that Dr. Beale was an innocent man, he certainly faced a risk, by his method of practice, that only extraordinary circumstances could warrant. The presence of an attendant during the operation would have insured corroborative evidence as to anything that might transpire.

When the dentist is playing the uncomfortable part of defendant, in either a criminal prosecution or a civil suit for damages, he is in a position to understand the difference between a careful and uniform method, with a well-kept office record of practice, and a careless, uncertain and unsystematic course of business.

A man's business methods, when by a searching examination they have been developed before a court of justice, bear with them double significance. If he is innocent, and has pursued his practice with proper methods and in a systematic manner, the

evidence to prove his innocence will probably be available. If, on the other hand, his business has been without system, and he has preserved no accurate record of his practice, even innocence may avail him but little. Again, the man whose testimony is certain and based upon accurate business methods and careful records, all else being equal, makes a far more effective witness than he whose statements are made in uncertainty.

"RESTORATION OF THE CONTOUR AND THE OCCLUSION OF TEETH," by Dr. L. Van Orden, San Francisco; read before the S. F. Dental Association, Nov. 11 and Dec. 9, 1895. The writer, after describing some of the methods of filling in vogue twenty years ago, says, I have tried to rivet attention upon the interproximate spaces, and show, in some measure, the bad results liable to flow from unskillful restoration of approximal decay, and the occasional necessity for creating cavities in the approximal surfaces of teeth, that spaces might be bridged over with filling material and the unprotected gum saved from frequent irritation, and even extensive absorption, through food pressure.

While the incisors, where the bicuspid and molars are present, are less liable to suffer from food pressure, every care should be used to prevent the possible formation of pockets by leaving the cervical portions of fillings finely finished and shaped, that the gum festoons may have every encouragement to resume their wonted position. We are forcibly reminded that these gum festoons have much to do with the beauty of a denture, when they present a blunted appearance through destruction of the underlying process in phagedenic conditions, or when rude methods have been resorted to in wedging teeth and finishing fillings.

But it is in the bicuspid and molars that the good or evil effects of our methods of preparing cavities and inserting and finishing approximal and approximo-occlusal fillings are most noticeable, and in them we will be justified in centering our main attention. There is a class of long, narrow and firmly set teeth, in which it is difficult to secure free space by wedging; the possibility of exposure of the pulp must be constantly kept in mind. Such cases are very trying, and shortening the depth of the cavity by a layer of amalgam may reduce the difficulty. The

main misfortune is, that the teeth are too narrow to permit of free cutting away of the margins of the cavity, that they may be removed from near contact with either the approximating tooth or the fillings. It is not enough that fillings be nicely rounded and contoured. To prevent renewal of decay, the margins must either be cut freely back or they must be carried back by change of position of the whole tooth through the process of wedging. In dense, broad and firmly set teeth, free cutting back of the buccal and lingual margins, having just enough room to permit a good finishing, and an absolute gum-protecting contact of the new approximal surfaces is all that seems to be indicated or even feasible at times. It is when we have to deal with an extensive series of approximo-occlusal cavities in a mouth where the teeth are confessedly lacking in power of resistance, that the slow and liberal wedging by cotton gives its best results.

Dr. Bonwill has demonstrated in a high degree his genius in the treatment of carious teeth by introducing and extolling his process of slow wedging with pink gutta-percha. I wish to commend that system quite highly; it seems to promise, in the main, most gratifying success. Its true use includes the free trimming of cervical margins at the first sitting, and the careful removal of carious material at that or subsequent sittings. His method, adapting pink gutta-percha base-plate as a matrix for controlling the shape of large contour fillings, should be adverted to.

In the restoration of the occlusal or masticating function of teeth, the loss of which is due either to accident, decay, or extraction of adjoining teeth, the question of retention or anchorage of the fillings, when crowns are not resorted to, is possibly one of paramount importance. Having recognized the desirability of making very heavy or plus-contour fillings in the molars and bicuspid, the writer has concluded as, no doubt, many others have, that surface or occlusal anchorage is the one best calculated to offset the unusual strain or tipping force; and during the past year has made use of broad, shallow dovetails cut in the occlusal surfaces with the aid of rubber and corundum disks. These disks, when new, are 5-16 and $\frac{3}{4}$ of an inch in diameter, and are very durable, becoming more valuable as their size is reduced. They cause little pain, and leave a fine, smooth surface, and by canting them an undercut of any extent can be secured. Mounted on a

short screw mandrel, and operated with a right-angled hand-piece, dovetails can be placed in locations that the straight hand-piece will not reach, notably in the tipped and rotated inferior second molars. A disk used in the angle hand-piece is invaluable in shaping the crowns of teeth for the anchorage of bridge-work. A broad, shallow anchorage is recommended in the bicuspid especially, because of the well known tendency of those teeth to split when extensively decayed. A tooth is no stronger than its weakest part, and it is well to preserve as much binding tissue between the lingual and buccal halves as possible. Other things being equal, it would not appear to matter whether a given amount of anchorage gold were placed perpendicularly in a deep narrow trench cut in the sulcus of a bicuspid, or placed horizontally in a broad, shallow dovetail. It is obvious, though, that the deeper the cutting the less is strength conserved. On the other hand, with a power mallet, facility of introduction of gold increases with breadth of surface. The desirability of reducing the size of the cusps of bicuspids, and their protection with a layer of gold, when fracture is imminent, should not fail of mention. The writer cheerfully admits that the use of corundum disks has long been known to the profession for the cutting out of the cross-fissures in molars and the sulci of bicuspids. The friability of the ordinary fissure disk has no doubt retarded their use. The use of carborundum and other points and stones for cutting out and shaping cavities may be referred to as well.

In concluding this subject, in all too brief a manner, I desire to more especially call your attention to the feasibility and comparative ease of restoring the masticating function of tipped and rotated second inferior molars (the first being absent), and also the conversion into a useful tooth of the comparatively worthless impacted wisdom teeth. In fine, to sound a note to the effect that however brilliant may be the operations in crown-or bridge-work and other interesting fields of dental effort, that to restore to function the natural dental organs, and to secure them a comfortable and sound resting place is, and will be ever, the most worthy calling of dentists.

"OPERATIVE MEASURES WITH DECIDUOUS TEETH," by Dr. L. L. Dunbar, San Francisco; read before the So. California Odonto-

logical Society, Oct. 1, 1895. Begin by making a child your friend, and its call a friendly one, and you will be surprised to know how soon its visits will be looked upon in the light of a privilege; a treat to be enjoyed. Every dentist in the enjoyment of a family practice should early make the acquaintance of the little ones of his clients; first, for the direction of prophylaxis, and subsequently for such operative measures as may be necessary; and should such be required, the way has been paved for successful work instead of the usual scene that accompanies the visit of an irrational mother to an equally irrational dentist, a half-hour of which generally uses up all concerned.

Extensive operations should not be necessary in very early life. Where parents have been properly instructed, and the child has been frequently examined, the first operation called for will be that of filling cavities on the proximate surfaces of the premolar and molar teeth, and in the grinding surface of the latter. These are the commonest manifestations of caries in the deciduous teeth, where early operation is of greatest importance. The looseness of structure of deciduous teeth makes results very uncertain where there has been much encroachment of dentinal territory; indeed, it seems almost impossible to save some deciduous teeth once the enamel has been penetrated by decay, owing to the excess of organic material. It is important, therefore, that the earliest appearance of weakness or decay be met promptly.

In all operations on the deciduous teeth avoid the use of the clamp and dam. The necessary preparation of cavities can always be made without any special attention to the exclusion of moisture. If, however, this should be found necessary, it can be accomplished by the use of two lengths of absorbent cotton roll of suitable diameter, placed one each on the buccal and lingual surface of the tooth, where they can be held by finger pressure. This will be found more efficacious and less formidable than the folded napkin.

Do not hesitate to use the engine if in your judgment it will do what an excavator cannot without inflicting more pain. This instrument has been made the bugbear of all dental operations by indiscriminate use, with points utterly unfit for the work, both in respect to size and condition. It should be used in the oper-

ation under consideration in preparation for retention only, using $33\frac{1}{2}$ or 34 inverted cone points (new and sharp.) The opening and cleansing of the cavity should be done with small hatchet and spoon excavators, making as few direct cuts as possible, rather paring the tissue in a gentle manner, without haste. When this is accomplished satisfactorily, a touch or two laterally with a small sharp cone point in the engine will give all the retention required. Where the cavity is one on the grinding surface and small, the cone point in the engine will be all that is necessary to properly prepare it for filling.

I can see no objection to the use of gold in small cavities of this character, provided it is used in some of the plastic forms for use without the mallet. The principal object to me seems to be to get the cavity filled as soon as possible with some material that will require the least time to insert, and be indestructible to that end. I have always used amalgam in these cases with satisfaction.

Where the interspace presents a cavity on each proximate surface, do not make the mistake of filling both cavities as one; if, however, for convenience of insertion the plastic has been put in in one piece, bridging over the interspace, it should be carefully separated by picking away with broach points, or flattened points made from broken broaches, until the space is clear. To do this effectively it is better to wait until the amalgam has crystallized somewhat. As this takes time, it would probably be better to fill one of the cavities with low heat gutta-percha, and complete the other with amalgam, which, at a subsequent sitting could be finished, and the other permanently filled in the same way.

The more formidable operative measures are presented to us in the treatment of neglected caries in the same region where the pulp has been invaded or encroached upon. These are usually brought on through the pain experienced, and anything like immediate filling is here out of the question. The cavities are to be opened with care and the disorganized tissue removed, particularly in the region of the orifice of the cavity. If the dentine in the direction of the pulp cavity is not much disorganized, it may be thoroughly sterilized after securing immunity from the invasion of moisture. The agents used for sterilizing should be wood creosote, carbolic acid, or a eugenol

solution of iodoform (preferably the latter). After sterilization a bit of asbestos paper, saturated with the sterilizing solution, may be applied, and over this an oxyphosphate filling.

Efforts at pulp conservation in deciduous teeth are not always successful, because of the susceptibility of their structure to decay-producing agents. It requires a nice judgment to determine upon the advisability of conservation efforts; a judgment to be gained only by experience and observation. It will oftener be necessary to devitalize in these cases, as in others more advanced, depending, of course, upon the conditions surrounding each—constitutional tendencies, etc.

When it is deemed necessary, carefully make an application of cobalt rubbed up in oil of cloves directly to the exposed surface, cover with gutta-percha, and at an early sitting (not later than forty-eight hours) remove the application and enlarge the canal opening with a round bur, after which pick out all the remaining pulp-tissue as carefully as may be; dry out the canal and fill it up with iodoform crystals, either in a menstruum of eugenol or with a vaporizer. Over this can be flowed salol by melting the crystals with the aid of a hot-air instrument, though this latter is not necessary, as I have had equally good results before the introduction of salol. The cavity can then be filled with the assurance of no further trouble.

Where much disorganization of pulp-tissue has taken place, and an alveolar abscess has supervened, it is only necessary to open freely, wash out and sterilize the root-canals; these being filled, as before, with iodoform crystals. Other methods of root-filling are not applicable in these cases, and it has been found that the permanent antiseptic character of iodoform insures the greatest immunity from destructive changes.

The deciduous molar should be saved at all hazards until the approach of the second bicuspid of the permanent set. The retention of both pre-molar and molar is desirable, in order to keep the first permanent molar from encroaching upon the territory of the bicuspids, thus inducing a crowding out of the arch of the later-erupting cuspid, producing the well-known deformity called by misinformed laymen "buck teeth," for which they, or their immediate neighbors, the lateral incisors, have been often sacrificed.

I should interdict the use of arsenious acid nerve paste in the mouths of children, and, in the absence of cobalt, use dental tincture of iodine, repeatedly applied. Concentrated spirits of ammonia is also an excellent and painless means of devitalizing deciduous pulps, and is also a satisfactory application for the relief of pain from an exposed pulp in a deciduous tooth.

It is rare that operations on the anterior teeth are called for, but here, as elsewhere, if decay has begun, you cannot operate too soon. Especial care should be exercised in excavating a cavity in the anterior teeth, as the pulp-chambers are greatly out of proportion to the size of the teeth. A good oxyphosphate will answer every requirement as a material for filling; and if salol or paraffine is flowed over the filling by the aid of the hot-air syringe, it will resist ordinary wear for a considerable time. Pulpless teeth are to be treated here upon the same general principles laid down for treatment of pre-molars and molars, cautioning the parent about the period of eruption of the tooth of replacement.

Most formidable among the operative measures with deciduous teeth are the necessary extractions. In a well-cared-for mouth these will be reduced to a minimum, and are likely to be only those which will require but a slight effort with a small elevator. There are cases that come under your hands, however, at a period when all the posterior teeth are wrecks, where extraction will be demanded. This is usually about the seventh or eighth year, when it will be well to consider the outcome of an extraction before deciding upon such a course. To keep the jaw patulous in the developmental stage has always been my practice, avoiding extraction unless forced to it by unremitting pain.

Never allow septic matter in a pulp canal to remain as a source of infection, nor permit the continuance of an alveolar abscess fistula, "because it affords a vent for gases;" if the septic source were removed there would be no gases, consequently, no abscess.

The Dominion Dental Journal for March, 1896.

"OBSTINATE BLEEDING," by G. V. N. Relyea, L. D. S., Oswego, N. Y. I will relate a case just treated. The servant girl of my family physician called to have an inferior molar extracted. The fangs diverged, which caused it to come very hard, but, taking time and care, I brought it out safely. Here let me say, better

be a minute in getting a tooth out than a second in breaking it. My patient left me, and, as usual, I forgot about it until the doctor came in the next morning to inform me that it commenced to bleed three hours after the operation and continued to bleed all night; he also reported much pain combined with the bleeding. Calling to mind the difficulty in extracting, I suspected a fracture of the process. However, after a close examination I found no injury had been done, and after removing the coagulated blood it should have been syringed out with tepid water; but I did the best I could under the circumstances, and, in a word, I arrested the the bleeding, and the young lady went out riding the next morning. I will now give my manner of treatment when all the necessities and conveniences are at hand. After the accumulations are removed, roll up a piece of bulbous paper hard, about the size of a small pea. This, fully loaded with wood creasote (not the commercial article, but *pure wood creasote*), force down hard, and continue to pack as you would gold in a cavity of a tooth. When three-fourths full, roll a larger piece and place in the mouth of the cavity, which must be forced down and left in for several hours. Should it show signs of bleeding again, remove and repeat the packing system, and, if properly done, success is certain.

Modelling composition will be found an excellent temporary stopping. It is easily manufactured, is a non-conductor, and the temperature of the mouth keeps it in a condition to be easily removed, and it will wear for weeks and months.

The Ohio Dental Journal for March, 1896.

"ARTISTIC STAINING OF ARTIFICIAL TEETH," by Geo. H. Wilson, D. D. S., Cleveland, O. There has been very little interest taken in this work, and we have no outfit for its performance put up in this country. George Poulson, of Dresden, and Ash & Sons, of London, make colors and implements for this work. They are stains, and do not add anything appreciable to the surface but color; while the pastes, which Dr. Geo. Cunningham, of England, exhibited at the Columbian Dental Congress, add a material to the surface, and in many places produce the desired effect that can be secured in no other way.

Any one desiring to begin this work can purchase either the Poulson or Ash & Son's set, through the dental depots, or the

materials I shall name, at any art store. I shall give two lists, the first is all I recommend to the novice; the second to be procured as the emergency requires, or the novice's ambition dictates. First. Sepia; light gray, No. 1; ivory black; oil of cloves; alcohol; one small pencil brush; one stippler brush; one spatula, horn or steel; one glass slab. Second. Rose pompadour (gum color); ivory yellow; brown yellow; celestial blue, and relief white. These colors are the Lacroix, except the relief white, which is Dresden. All mineral paints have to be burned into the porcelain. We will describe this process later.

We will first describe the use of the various articles: A plain glass slab, on which to mix the colors in small quantities; a spatula, with which to grind or mix the paints together, or with oil; a stippler brush, a short, stubby, square end brush, with which to spread or even the paint by striking (stippling) with the end of the brush; alcohol, with which to clean the teeth, the brushes, and to remove the waste paint from the slab; oil of cloves, to thin the paints as necessary for the desired effect. There are other oils that can be used, as oil of lavender, fat oil of turpentine, etc., but the oil of cloves is probably already in the office. Gray and black are the foundation colors of nearly all the work we will probably be called upon to do. The ivory black will rarely or never be required by itself, but is used to deepen the color of both gray and brown. A very little black will have a decided effect, and should be thoroughly mixed before applying.

Observation of the natural teeth in the mouths of our patients is absolutely necessary to distinguish the brown and gray shades; also a little time must be spent in the laboratory in studying the effect of a thin and a thick coat of each of the colors, and more especially to note the effect of the stain upon the original color of the porcelain tooth. If the tone of the tooth is yellow, and brown is added, it will not only deepen the color, but will bring out a most decided brown color; but if the tone is blue or gray, then the brown would first deepen the original color, and would give only a decided brown, as quite a quantity had been added. The study of this fact means the success or failure of staining porcelain teeth. Mastering this point means successfully producing in the laboratory what the eye for color has seen at the chair is needed.

It must not be supposed that this method can be used in all cases; it is the exception and not the rule. There are two classes of cases to which it is especially applicable. The one is where we have not at hand such a set of teeth as we desire in color. We can deepen the foundation color, change the tone from gray to brown, or brown to gray, and vary these from a light tint to a very decided one. It should be borne in mind that we do not produce an underglaze color, but one upon the surface; hence its legitimate use is to produce stained teeth, which are more suitable for middle and aged people than for the translucent effect of earlier life. The stains can be largely removed by the use of sandpaper, or by the severe use of the felt wheel and pumice. It is not necessary in the proper polishing of vulcanite to remove the stain, but by an indifferent use of the sandpaper and pumice a portion of stain will be removed, but not by any use the denture can have in the mouth. The other class is in partial cases, to reproduce peculiarities of the natural teeth. It is not uncommon that we have brown and gray discolorations in the same tooth, as brown at the gingival portion and gray at and near the proximate surfaces, ranging from incipient black decay upon the proximate surfaces, appearing gray through the translucent enamel, to the more extensive gray color of leaking fillings.

Desiring to change the tone of the tooth, or give a deeper shade, it will be necessary first, to remove all wax and clean the tooth with alcohol, drying it with a clean cloth, then hold the tooth by the pins in a pair of pliers; having mixed the color with oil of cloves, either thin or thick as we desire a light or dark shade, apply with the pencil brush. The paint can be more evenly spread with the stippler brush. The surface should be gone over with a stipple motion, that is, striking with the end of the brush, the brush being held at a right angle to the surface of the tooth. At any place that the paint is not heavy enough, more can be added by the pencil brush and then stippled. If the color is too heavy at any portion of the tooth it can be removed by wiping lightly with the end of the finger and then stipple. When all of the teeth are so treated they are placed upon a slab to dry.

To fix the color and give it a glazed surface it is necessary to subject it to a high heat, about 2,000 degrees F., or the fusing

point of gold. This burns out the oil and fuses the solid particles of the stain which unite with the surface of the porcelain. It makes little difference how this heat is obtained, just so we get it, if evenly applied, that is, not so suddenly as to fracture the tooth. Having thoroughly dried out the oil by placing the fire-clay slab over the Bunsen burner, the teeth can be safely subjected to the higher heat and brought to the proper temperature in two minutes time. Any furnace can be used, or, not having one, any one having a blow-pipe can easily improvise one at small expense. Get a piece of fire-clay slab about an eighth of an inch thick, upon which the teeth are placed, with the pins resting upon the slab. Shape a piece of No. 36 standard gauge platinum plate, so as to cover and enclose the teeth, except one side, which is left open as a peep-hole. This miniature oven or furnace, containing the teeth just from the brush, is placed over the Bunsen burner for about five minutes, when the flame from the blow-pipe is placed against the under side of the clay slab, gradually bringing it over upon the top of the platinum. Two minutes' work of the blow-pipe should suffice. Take away the blow-pipe and turn off the flame of the Bunsen burner at once, remove the platinum cover and permit the teeth to remain upon the slab till they are sufficiently cooled to handle with the fingers without discomfort, when the work is finished. The work will require less time than I have been in telling it. I have taken a porcelain tooth I had fitted to the root, stained, burned, cooled and returned it to the mouth in fifteen minutes' time.

While the instructions I have given have been for evenly shading the teeth, by the same process, that is, laying on with the pencil brush, whipping off with the finger, and stippling, any result desired can be produced.

If we desire to combine colors we should always burn a sample to know what the result will be. Thus, the ivory black will deepen the gray or brown according to the amount of black used, but if we combine blue and yellow we will get green, then by modifying this green with brown we will get the peculiar green stain so often found in the mouth.

Salivary calculus effects can be produced by laying on the relief white without thinning with oil, burn on and then stain with brown. White spots or an over-deposit of lime salts can be rep-

resented by a thin layer of relief white, stippling and burning in. Atrophy and worn conditions are produced by grinding and then staining.

Gum color, either light or dark color, according to the amount of rose pompadour used. A still lighter effect can be produced by building up the portion representing the gum with some white body; bake it on, then paint with the gum color and fire.

I have not been successful in imitating gold fillings. Precipitated gold is the form of gold accompanying the English and German sets; they appear perfect when first applied, but will not stand the wear necessary in the mouth. Dr. Grant Molyneaux informs me that the chlorid of gold will withstand the wear. I have not tested it. To burn on the gold will require about 500 degrees less of heat than the other colors mentioned.

British Journal of Dental Science for March, 1896.

"ORAL SURGERY," by Edmund W. Roughton, B. S., M. D. (Lond.), F. R. C. S., Eng. *Leontiasis Ossea*. This is the name given by Virchow to a curious condition in which the bones of the skull and face become greatly deformed by the development of irregular growths of bone. This condition has also been named Diffused Hyperostosis.

The disease usually begins in young subjects. In some cases its onset has been marked by pain and swelling of the face or by other inflammatory symptoms following upon an injury or exposure to cold. In other cases the disease has begun and progressed insidiously, without any discoverable cause. As the bony growths increase in size, the features become hideously distorted, the eyes being displaced and sometimes destroyed by pressure, and respiration and mastication are greatly impeded by the invasion of the nasal and buccal cavities. The disease may last for many years, death eventually resulting from emaciation or from some other intercurrent affection.

On examining the skull of a patient who has suffered from this condition the bones are found to have become greatly changed. The disease may be of limited extent, perhaps only affecting one maxilla, or it may involve all the bones of the skull and face. The affected bones present a coarse tuberculated surface and are studded with rocky, shapeless outgrowths projecting into the

orbits, nasal cavities, and mouth, as well as upon their external surfaces; these outgrowths sometimes assume considerable size, forming tumors which may project as much as three inches from the face. In the specimen shown the mandible is scarcely affected, but in some cases it may be so much enlarged that its ramus or body measures five inches or more in circumference.

On section the bones are found to be composed of uniformly hard and dense, but finely cancellated, bone; the maxillary frontal and ethmoidal sinuses may be completely filled up with bone so that no trace of these cavities can be found; the sockets of the teeth may be similarly affected.

Microscopic examination shows two kinds of bony tissue, the one compact and the other cancellous. The compact tissue does not differ much from the normal structure, but the cancellous tissue shows large irregular spaces somewhat resembling primary bone; there is but little trace of lamination, the lacunæ are very numerous, small, and arranged irregularly; definite Haversian systems are for the most part absent.

With regard to the etiology or pathology of leontiasis nothing is known.

The treatment is very unsatisfactory. Drugs are useless, although some surgeons think that benefit may be derived from the prolonged administration of iodide of iron.

When the disease is of limited extent, affecting only one bone, or giving rise to one or two definite excrescences, the surgeon is justified in removing the affected parts by operation; but the proceeding must be regarded as palliative rather than curative.

Acromegaly. This is characterized by great overgrowth of the hands and feet and deformity of the face. The legs and forearms are not usually enlarged. The spine often presents a posterior curve in the dorsal region. The skin is thick and sometimes warty, and the hair may be unusually long and coarse. The cranium is often enlarged, especially in its antero-posterior diameter. The jaws, especially the mandible, are nearly always enlarged. In the patient from whom the accompanying illustrations were taken, the lower wisdom teeth were 2.8 cm. further apart than the corresponding teeth of the upper jaw, and the lower incisors were 1.7 cm. in advance of the upper teeth. The nose is increased in size, the lips are thick, the lower one having a tendency to protrude

and hang down; the tongue is large and soft, and presents ridges and furrows on its upper surface.

This disease affects persons of either sex, and has been most often observed between the ages of twenty and forty. The subjects of this disease often complain of headache and general lassitude, and the speech is usually thick and slow. In women the catamenia are nearly always suppressed.

The pathology of acromegaly is not at present understood. All the tissues of the affected parts are equally overgrown; in the hands and feet the bones are enlarged as well as the soft parts. In several cases which have been examined post mortem the pituitary body has been found enlarged, atrophied, or affected by a new growth, and pathologists are inclined to think that disease of this body is an essential factor in the production of acromegaly; in some cases the thyroid gland, thymus or sympathetic nerves have been diseased, but it is not known at present whether these conditions are causal or casual.

No treatment is of any special use.

Osteitis Deformans. This is a very chronic form of inflammation of bone, occurring in old people. The affected bones become increased in size and bent. The disease affects the bones of the cranium and the long bones; those of the face and of the hands and feet are unaffected. The distribution of the disease is therefore in a sense complementary to that of acromegaly, from which it may be readily distinguished. Nothing is known as to its cause, and no treatment hitherto used has been found to do any good. The disease is briefly noticed here to distinguish it from leontiasis and acromegaly.

Actinomyces. This is a disease which results from the introduction into the body of a vegetable organism called *Actinomyces*. This organism appears to grow naturally upon barley or corn, and for this reason the disease is much more common among cattle than in man. Actinomyces of the tongue and jaws of cattle has been long known to veterinary surgeons, but it is only during the last fifteen or twenty years that its pathology has been understood, and its occurrence in man recognized. The manner in which the parasite enters the body varies in different cases; sometimes particles of barley or corn have been found at the seat of affection. In man the disease may begin in the mouth, in the intestines, in

the lungs or in the skin. Wherever the parasite establishes itself in the body it gives rise to inflammation and the formation of a large amount of granulation tissue. In some cases the granulation tissue becomes converted into fibrous tissue, forming a definite lump or tumor. In other cases the inflammatory process goes on to suppuration, abscesses are formed and discharged, and a fungating mass of granulation tissue and parasitic growth protrudes on the surface.

Although the parasite may lodge in almost any part of the body, the jaws are the structures most frequently affected. The parasite usually gains access to the pulp of a carious tooth and gives rise to a train of symptoms resembling those of alveolar abscess. The inflammatory swelling slowly increases, so that in a few weeks a definite tumor has formed. When the maxilla is affected the tumor bulges at some part of the cheek; when the mandible is the seat of the disease the swelling is most often found at or near the angle of the bone. The tumor, which is fixed to the jaw, is at first hard and subsequently softens so that fluctuation may be obtained. Eventually the swelling bursts on the face or into the mouth, discharging a turbid serous fluid in which are suspended very characteristic small yellow granules consisting of masses of the parasite.

On passing a probe into the sinuses bare bone can be readily detected. The skin and subcutaneous tissues of the face and neck become diffusely infiltrated and the submaxillary lymphatics may inflame and suppurate. The progress of the disease is accompanied by a certain amount of febrile disturbance, the temperature varying with the freedom of the discharge. After a longer or shorter time the prolonged suppuration leads to emaciation or even to lardaceous disease. In some cases the disease assumes a pyæmic form and metastatic deposits take place in the internal organs. As a rule the disease is chronic, lasting one or two years, but in some cases death occurs in a few months. The prognosis seems to be worse when the maxilla is affected than when the mandible is the seat of the disease.

On examining the mandible after death or after removal, it is found to be expanded and hollowed out by a number of cavities opening on the surface by large cloacae. These appearances are best seen after the bone has been macerated to remove the soft

parts. In the recent state these cavities are filled up with a soft honeycombed whitish mass, composed of granulation tissues and parasite. On microscopic examination this granulation tissue is found to contain a number of small radiate masses which are minute colonies of actinomyces. The centre of each colony is composed of extremely fine interlacing threads and small round bodies resembling cocci; the periphery is composed of club-shaped bodies which are the enlarged bulbous ends of the threads. These club-shaped bodies are the most characteristic feature of the parasite, but they are not an essential part of it, being probably only the swollen and degenerated ends of the thread or filaments (so-called involution forms). The threads are best seen in pus. They are long and delicate; they often branch dichotomously and contain a number of round bodies like cocci. They are the actively growing and essential part of the parasite. Actinomyces has been cultivated outside the body and the disease has been reproduced by injecting artificial cultures into animals, thus proving that the parasite is the cause of the disease.

Treatment. As soon as the diagnosis is established a free incision must be made into the affected parts, and all the soft granulation tissue thoroughly scraped or gouged away, the cavity in the bone being treated in the ordinary manner. Iodide of potassium in large doses has a marked effect on the growth of actinomyces, and should be prescribed more especially if it is found impossible to eradicate all the diseased tissue surgically.

"TRIGEMINAL NEURALGIA AND NASAL DISEASE," by Mayo Collier, F. R. C. S., from the *Lancet*. Within the last twelve months two cases of severe and persistent facial neuralgia that up to then had defied all treatment have come under my care; they were referred to me by my colleagues, Dr. Guthrie and Dr. Cagney of the North West London Hospital. I have postponed till now publishing an abstract of these cases in order to try the validity of the cures by the test of time.

The first case was that of a man aged fifty who was for some time under the care of Dr. Turner, of the Hospital for Epilepsy and Paralysis, Regent's Park, and I am indebted to him for the early notes of this case. In short, this man had suffered severely for the last four years, and latterly the frequency, duration, and

intensity of the attacks had made life almost unsupportable. An examination of the nasal cavities revealed extensive disease of the middle turbinated bone on the right side. The removal of this resulted in almost immediate as well as permanent and complete cure. The second case, that of a female, aged thirty-eight, kindly sent me by Dr. Cagney, was on all fours with the man's case, only of longer duration (twelve years), and at times greater intensity. An examination here revealed disease in the same situation, and the same fortunate result followed its removal. Of the many recorded cases of trigeminal neuralgia I find few attributed to nasal disease, but taking into consideration the wide distribution in the nasal cavities of the many branches of the nasal ganglion on the second division of the fifth nerve, it is not surprising that a considerable number of these cases are, in fact, due to irritation in one form or another of the branches of this nerve in the nose.

The Therapeutic Gazette for March, 1895.

"STUDIES IN ANÆSTHESIA AND ANÆSTHETICS." Keefe writes under this title in the *Boston Medical and Surgical Journal* of November 28, 1895. He thinks if there is any suspicion of weak heart, the patient should be put under the influence of digitalis for twenty-four hours, and given a hypodermic of four grammes of the tincture before beginning the inhalation.

Every one administering an anæsthetic should measure the dose. Fifteen grammes (or half an ounce) of chloroform is a proper dose to produce anæsthesia in an adult, and should be poured on at once, and no more should be used except as needed to continue the anæsthesia.

Forty-five grammes (or 1½ ounces) of ether is enough for a woman, and sixty grammes (or two ounces) is enough for a man, and should be the charging dose. There may be an exceptional case where even sixty grammes will not subdue a patient, but such an one should be considered not a good subject for ether, and chloroform should be substituted or added.

The face, pulse, and respiration, in order named, should be watched attentively during chloroform-administration, and the respiration and pulse in ether. It is not enough to see that the chest moves; we must hear the air enter the lungs.

A good plan is to combine chloroform with ether, especially if one fears to assume the responsibility of using chloroform; and twelve grammes (or three drachms) of chloroform and thirty grammes (or one ounce) of ether is a good charge and can be depended upon to produce anaesthesia. In this way the stage of excitement so common in ether anaesthesia is avoided.

Withdrawal of anaesthetic, the frequent momentary inversion of the patient, artificial respiration, strychnine, heat, digitalis, the galvanic battery, and sponging or sprinkling of face and breast with ice-water, are the means for restoration of function arrested by anaesthetics.

"OPERATIVE TREATMENT OF THE DISEASES OF THE ANTRUM OF HIGHMORE." Freeman (*Journal of Am. Med. Ass'n.*, Nov. 30, 1895,) holds that when an empyema of the maxillary sinus is due to disease of a molar or bicuspid the tooth should be extracted under nitrous oxide gas, and the cavity reamed out to admit a tube four to six millimeters in diameter, thus enabling the surgeon freely to irrigate and medicate the cavity. The most desirable apparatus for drainage is a gold tube, with a collar fastening it securely to a neighboring tooth. Where it is necessary to clear up the diagnosis as to the presence or absence of a foreign body or growth, exploration through the canine fossa is proper. The opening should be large enough to allow the introduction of the finger, and is easily accomplished by means of a drill. After carefully exploring the cavity, removing any cause of irritation, curetting, if necessary, and breaking down bands, a light iodoform gauze packing is applied. The author advocates packing daily with thymol gauze for a week, and then fitting an obturator of metal or hard rubber, which is held in position by the pressure of the cheek. Introduction of tubes of small calibre into the antrum for drainage is perfectly futile, since the muco-pus is too thick to escape through them.

The intra-nasal irrigation and drainage route is usually to be preferred to the oral. Treatment through the middle meatus is to be condemned. Operations through the wall beneath the inferior turbinal are of real value. Mikulicz makes an opening three-eighths of an inch broad by five-eighths of an inch long, far up under the inferior turbinal, where the wall is usually quite

thin. Through this large opening the pus can drain quite freely into the nose, although the perforation is at times some distance above the floor of the antrum. It is not, however, an operation to be undertaken lightly, for the pain without total anesthesia is considerable, and the hemorrhage frequently demands tamponing of the nares for one or two days. This operation is to be ranked with that through the canine fossa for severity, while it is inferior in that it allows no examination of the interior of the sinus. Even with so large an opening, some patients are unable to cleanse the cavity themselves.

Less objectionable, though still possessing serious drawbacks, is the method of Krause. He penetrates the outer wall of the inferior meatus far up and back with a strong curved trocar and cannula, washes the cavity once, and insufflates iodoform. But he puts nothing into the opening to maintain its patency, and so every second day the cannula, armed with an obturator, must again be forced into the cavity. If one considers how rapid the healing of such punctures is, and the great tendency there is for granulations to form, he will realize that this treatment constitutes really a series of operations which must be done under cocaine. Bloch objects on the ground that the opening is extremely difficult to find. While some of Krause's cases are cured in a few weeks, others require months of treatment, and few persons could be found in this country to submit to such an ordeal. Another objection is that the patients are unable to carry out the treatment themselves. Again, both Krause's and Mikulicz's instruments are too large to be used in making a trial puncture, so that the diagnosis in obscure cases must be confirmed by another method before undertaking theirs.

While many ingenious methods have been devised for the intra-nasal operations, one very important thing seems to have been overlooked, viz., a simple and practical means of keeping open the perforation, so that the treatment may be readily carried out by the patient as well as the physician. To overcome this objection has been the writer's principal aim in the operation presented below. In suspected cases of empyema it is often necessary to irrigate the cavity, as first proposed by Ziem, to determine whether pus be present. While he prefers to make the puncture through the alveolus, the majority of operators lean to the intra-

nasal position. Lichtwitz goes so far as to make a trial puncture under the inferior turbinal, and, finding pus, operates on the sinus through the mouth. Following him, the author also uses a straight trocar and cannula, but, instead of making the opening in the Mikulicz-Krause position, he perforates low down and more anteriorly. The nasal duct lies thirty to thirty-five millimeters from the naso-labial junction, and, unless it opens in a furrow, its exit is high up under the turbinal. Freeman keeps close to the floor of the nasal fossa, which at times necessitates penetrating thicker bone, but this is quickly and almost painlessly done, and the disadvantage is compensated by entering the cavity near its bottom and thus securing better drainage, while the risk of injury to the tear-duct is avoided and a resting-place for the head of the tube is obtained inside the pyriform aperture. The inferior turbinal and naso-antral wall beneath it are first anesthetized with ten-per-cent. cocaine solution. Using special trocar and cannula, a few taps with the mallet cause it to penetrate the wall, the entrance into the antrum being unmistakably recognized by the absence of further resistance. Withdrawing the trocar, warm sterilized normal salt solution is at first gently, later with considerable force, syringed through the cavity. Should the water return perfectly clear, even after repeated flushing, the cannula can be removed and no harm results. The author emphasizes repeated flushing; in one case he used over a pint of water before obtaining a trace of pus, but finally washed out a pus cast of the cavity, the presence of which had caused a marked edema of the eyelids on that side. When pus is present, however, he does not remove it at once, but reintroduces the trocar, withdraws the cannula, slips a drainage-tube over the trocar till it penetrates the cavity, and, withdrawing the trocar, completes the washing of the sinus by syringing through a long silver tube which accurately fits the permanent tube. If pus is now obtained, the tube has been correctly placed. The antrum being thoroughly cleansed, air is blown through to dry it, and then an antiseptic powder is insufflated. The operation, including cocainization and treatment, takes but eight minutes, and few complain of any pain. The physician should treat the case for the first few days until the nose becomes accustomed to the tube; later the patient can learn in a minute to pass the wash-tube and cleanse the cavity for himself.

Before undertaking any operation on the antrum, its position should be determined by grasping the three points forming the antral triangle—the thumb in the canine fossa, the first finger on the malar process, and the second finger on the edge of the orbit. Within these boundaries must lie the antrum; and, knowing this, one can hardly go astray.

The set of instruments necessary for this operation consists of a trocar and cannula, silver drainage-tube, and a mallet; for irrigating the cavity, a wash-tube, syringe, and rubber tube with connections. The drainage-tube may readily be cut down to fit the case. The cannula is steel, as softer metal splits in penetrating thick bone. The wash-tube goes nearly through the drainage-tube in order to free it of any accumulations.

Among the many advantages of this operation are: (1) the ready acquiescence of the patient; (2) the celerity and the slight degree of pain with which it is done; (3) the completion in one short seance of the diagnosis by lavage and the operation for therapeutic purposes; (4) the small wound, and the loss of only a few drops of blood; (5) the ease with which patients are able to treat the cavity themselves; and (6) the fact that total anesthesia, and therefore assistants, are unnecessary.

The disadvantage is that the cure is delayed beyond that reported for some of the other antral operations; but when once healed these cases do not seem to have the reported tendency to recur. With larger tubes the cases have done better, and by employing the Friedlander dry method of treatment the outlook is most promising. The cases which have resisted treatment, and which have shown no progressive tendency to improvement under irrigation, have usually revealed some cause for the continuance of suppuration on exploring through the canine fossa. The ease with which remedies may be applied to the antrum by this method is in its favor. Iodoform is out of the question in one's private practice, and Chiari denies that it gives the positive results claimed for it by Krause, Siebenmann, and others. All operators, however, acknowledge the excellent results obtained by packing the cavity with iodoform gauze, and Chiari packs it even through the 4- to 6-Mm. opening in the alveolus, which he recommends.

In closing, a few words of caution suggest themselves. Do

not attempt to aspirate the cavity. The blood-vessels are but poorly supported, and, the normal openings being closed, the cavity may be cupped. Do not syringe with strong solutions of peroxide of hydrogen, as advised in many books. Even after the cavity has been irrigated some pus remains, and the pressure from the liberated oxygen, except with very weak solution, causes intense pain. Do not make an exploratory puncture through the alveolus where dental caries exists, or you may readily infect a healthy antrum.

OWEN (*Omaha Clinic*, vol. viii, No. 4) reports a number of cases of empyema of the maxillary sinus, and formulates the following rules for treatment: In acute cases of mild type, all that is necessary, besides the removal of the cause, is the employment of the ordinary means for managing a severe coryza.

In acute cases of a severe type, dependent upon intra-nasal disease, besides the ordinary means as suggested, efforts should be made to irrigate the sinus through the normal orifice. Failing in this, the symptoms being urgent, and ordinary means having been exhausted, an opening should be made through the wall in the inferior meatus for drainage and irrigation. In the latter instance, if from some configuration of the part it is not possible to penetrate the antrum, a small opening for drainage and irrigation should be made between the roots of the second bicuspid and first molar, if the first and second molars are sound, but if one is diseased and useless it should be drawn and the puncture made through the empty socket.

In all cases, acute or chronic, dependent upon diseased teeth, the teeth should be drawn and the antrum punctured through an empty alveolus.

In chronic cases, when the cause is in the nasal cavity, if poly-poid degeneration of the mucous membrane, caries or necrosis of the wall be not apparent, the cause should first be removed, then irrigation through the natural opening should be given a fair trial. Failing to irrigate through the natural opening, or to cure by this means after a reasonable trial, a counter-puncture should be made in the inferior meatus for drainage and irrigation. A cure not having been reached in a few weeks by this method, a large opening should be made in the canine fossa for curettage and irrigation.

In long-standing aggravated cases, where degeneration of the mucous membrane, caries or necrosis, etc., is reasonably certain, besides the removal of the cause, a large opening should be made in the canine fossa for curettage, drainage, and irrigation, and a counter-opening made into the inferior meatus. Frequent irrigations with a warm solution of boric acid should be the rule, and such other topical applications should be employed as the case may demand.

Journal of British Dental Association for March, 1896.

"ORAL HYGIENE," by William Hern, M. R. C. S., L. D. S.; read at Annual Meeting of British Dental Ass'n, at Edinburgh, August, 1895. The clean mouth (a) has the teeth bright and polished-looking—with their fissures, cervical margins and interstitial surfaces clean and free from deposit; (b) has the gum margins pale pink in color, hard, gristly, and closely applied to the necks of the teeth; (c) has little or no salivary calculus; (d) has little or no caries; (e) has the teeth free from any dark, hard deposit at the gum margins; (f) has the breath pure and inoffensive.

The unclean mouth (a) has the teeth of dull, cloudy appearance, with their fissures, cervical margins and interstitial surfaces filled and covered with a soft inspissated deposit; (b) has the gum margins reddened, tumid, soft or spongy, and standing away from the necks of the teeth; (c) has abundant caries; (d) has abundant salivary calculus; (e) has a deposit, more or less plentiful, of dark, hard, tartar-like material on the teeth at and below the gum margins; (f) has more or less pyorrhoeic discharge from the gum margins and sockets of the teeth; (g) has abundant accumulation of food particles in all degrees of fermentation between and about the teeth; (h) has the breath tainted with an offensive odor.

The measures directly preventive of decay are: (1) Regular and systematic brushing of all the surfaces of the teeth, as well as the gum margins, with the tooth brush used with a vertical, rotary *wrist* motion, night and morning. (2) A recommendation to have an alternation of two or more brushes in use at a time, and to keep them during the intervals of use freely exposed to the air. (3) The use of a simple tooth powder at least once daily. (4)

The brush to be *small*, moderately stiff, and anatomically shaped and curved. (5) A brief explanation to all patients who require it, of the chief causes of decay and the important part played by food and organisms in its cause. (6) Show the patients with the mirror the difference between the clean and unclean conditions; point out deficiencies in the use of the brush, and thus bring each patient to take an intelligent interest in his own mouth and aid the dentist in his efforts of prevention. (7) The use of an anti-septic and astringent mouth wash in some cases, especially those in which plates are worn. (8) The use of a quill toothpick for men, and the floss silk, rubber, or other strip for women and children. (9) Periodical inspection of mouth by dentist.

Indirectly preventive measures in work. The main objects of these would be to prevent any coigns of vantage for the lodgment and fermentation of food and *debris*, and to obviate inaccessible refuges for organisms. (1) *In Teeth*.—(a) By filling cavities; (b) by levelling up valleys, *e. g.*, *crevasses* of fissure. (2) *Between Teeth*.—(a) By careful countouring—this is a measure I would emphasize to the utmost of my power; (b) by *occasional* spacing; (c) by judicious extraction in overcrowded arches. (3) *Around Teeth*.—(a) By removal of salivary calculus; (b) by removal of dark deposit under the edges of the gums; (c) by treatment of the gums; (d) by accurate fitting of collars and crowns—the “tea-cosy” varieties are fruitful incubators of organisms; (e) by finishing the cervical and other edges of our fillings flush with surrounding tooth surface. (4) *Between Plates and Teeth*.—(a) By carefully fitting plates and bands; (b) by frequent removal of plates, and thorough and systematic cleansing of the plate and bands with stiff brushes and cane sticks. By dressing, crowning, levelling-down, or removal of roots and derelict remnants of teeth. By constructing all bridges and fixed mechanical appliances with free access to the tooth brush, and in such manner as not to provide favorable nooks as hiding places for organisms.

The Medical Record for March 28, 1896.

“A CASE OF EXCISION OF BOTH UPPER JAWS, OF BOTH MALARS, OF BOTH PALATINES, OF BOTH NASALS, OF BOTH INFERIOR TURBINATED, OF THE ETHMOID, OF THE VOMER, OF THE LEFT LACHRYMAL, AND OF A PORTION OF THE PTERYGOID PROCESS OF THE SPHEN-

OID, FOR THE REMOVAL OF A RECURRENT OSTEOCHONDROMA," by A. C. Bernays, A. M., M. D., M. R. C. S., Eng., Prof. of Clinical Surgery at the Marion-Sims College in St. Louis, Mo. I am about to record the most extensive surgical operation on the face that I have ever performed. The literature of surgery does not show a similar one, and I report it because it is of great interest in demonstrating the wonderful tolerance which is shown by the organism against the most severe and mutilating operations performed on the bones and tissues of the face, and also to encourage surgical interference in malignant disease in this region by this example of great relief given in a most aggravated instance.

In nearly twenty years of surgical practice I have operated on forty-one cases of tumors of the superior maxillary bones requiring total excision of this bone. In a few cases the orbital plate was left, and in some others more than the superior maxilla was removed. In three cases, including the one I am about to describe, both superior maxillaries were removed. Cases of epulis and small tumors of the alveolar process are not considered in this report. I have known some very small ones, involving nothing but the gums and the alveolar process, to give rise to enormous growths, if the primary operation was followed by a return. I desire to consider in this report the surgery of those only which necessitate extensive excisions and resections. Of the forty-one cases thirty-six were of malignant tumors, twenty were certainly carcinomata, twelve were sarcomata, and four were of such a structure that I was left in doubt after examining the sections. This was particularly the case with one tumor, a melanoma, which was remarkable for being so thoroughly infiltrated with pigment that a structure could not be made out at all in many places. Even the submaxillary glands in this case were so black and so friable when hardened that a structure could not be made out.

There were two deaths following operation, one a death upon the operating-table. In that case the tumor had pushed the eyeball entirely out of the orbit and the mass was found to extend into the cranial cavity, having grown through the horizontal plate of the ethmoid. The other was death from shock about twenty-four hours after the operation.

In these malignant cases the final results were very different. In some few there was immediate recurrence; in others a long

period of health was followed by recurrence or metastasis; in one-third, twelve cases, there was no recurrence for more than two years and these may be safely considered cured. Of the five benign tumors two were large osteomata, one a fibroma, one a cystic odontoma, and one a hyaline enchondroma. All of these made permanent recoveries.

History of the case. The patient, thirty-two years of age, married, farmer, was sent to me by his physician July 6, 1892. I sent him to the City Hospital and he was kept under observation there for eleven days before I performed the operation. There was no history in the family of any abnormal growth in any of its members. Patient had no ailment of any kind, had devoted himself to farming, had always been robust and healthy. His habits had been very good, his hygienic surroundings of the best; he drank and smoked but very little.

About April, 1891, the patient noticed an abnormal growth of the upper jaw, which growth gradually began to protrude from the mouth under the upper lip. When he first realized the seriousness of the affection the growth was about the size of a pigeon's egg. It was operated on in Kansas for the first time in June, 1891, and is said to have then been of the size of a small orange, diameter about two and a half inches. The operation had for its object simply the removal of the tumor by excision. By December, 1891, it had again reached its former size. It was removed a second time, the operation being similar to the first one. The growth began to return and in about four months had reached the size shown in the photographs, which were taken in the hospital in July, 1892. The large tumor involved nearly the whole face, including the superior maxillaries, the palate, the nose, the malars, and all the soft parts surrounding these bones. The growth was somewhat larger upon the left side than upon the right. Protruding and filling nearly the whole oral cavity was a large tumor, dense in structure, very slightly movable, and somewhat elastic, with a hard coating of dried purulent discharge.

The operation was performed July 17, 1892, in the following manner: Tracheotomy was performed below the isthmus of the thyroid gland; the patient was chloroformed thereafter by means of the Trendelenburg apparatus. A large sponge with a ligature was then pushed back over the tongue and packed into the

pharynx in order to prevent the entrance of blood into the larynx and cesophagus.

The first incision was made beginning at the right angle of the mouth and extending three inches outward and upward in the direction of the zygomaticus major muscle to the malar bone. All the tissues were then dissected away from the bones and from the tumor on the right side of the face as high as the external angle of the eyelids. The tissues of the orbit were then separated by means of a Langenbeck periosteal elevator from their attachment to the floor of the orbit. Next the diseased skin of an area of more than two square inches was removed from over the left superior maxillary bone. An incision near the left angle of the mouth, beginning in the wound of the cheek, was then made through the upper lip. The nose and the remaining skin on the right side were then separated from their attachments to the bone and the tumor. The contents of the orbit on the left side were freed from the floor of the cavity just as they had been on the right side, care being taken not to injure the eyeball.

Both malars were separated from the frontal with the strongest bone forceps, the two nasals from the frontal, and with the chisel the pterygoid process of the sphenoid was broken off. The whole mass was then rolled out over the frontal region and this extirpation or evulsion of the whole mass did not give rise to serious hemorrhage. The perpendicular laminae of the ethmoid and of the vomer, parts of the lateral masses of the ethmoid, and the lachrymal bone of the left side, were included in the mass, which was now removing by snipping off resisting spiculae of bone and mucous membrane of the naso-pharynx. On the right side a portion of the malar and external wall of the antrum were left, because they were clearly free from the growth. All irregularities of tissue and all suspicious shreds were now trimmed off with scissors, leaving in the end a clean, enormous cavity, which was dusted with iodoform powder and temporarily packed with gauze. The flaps of Schneiderian membrane hanging down from the horizontal plate of the ethmoid and the mucous membrane of the roof of the pharynx and naso-pharynx were stitched together with fine silk sutures. The flaps of skin of the cheeks, nose and upper lip were replaced and carefully stitched together with numerous sutures.

The whole upper face cavity was now filled with iodoform gauze, the end of the strips being allowed to project through the nostrils, which formed good drain holes in the veil of skin which hung down like a mask from the forehead and orbits. The tumor which protruded from the mouth appeared to be cartilaginous. The left antrum was one solid mass of bone, which protruded into the nasal cavity and had caused displacement and erosion of the vomer and septum of the nose. The teeth were loose in their sockets and their roots were surrounded by a pulpy cartilaginous growth. The after-treatment was very troublesome. Patient was fed through a stomach tube for forty-eight hours, and after that he was fed through a pharynx tube for a long time, until he learned to eat and drink after a fashion peculiar to himself.

The patient gained rapidly in health and strength. He expressed himself as exceedingly thankful and was no doubt much pleased at the result. I think that his improvement and satisfaction were largely due to the removal of the offensive and disfiguring mass. Fig. 3 shows him to be anything but a thing of beauty and it is by far the best view that could be given of him. A profile would show a deep and "aching void" where the projection of the face ought to be.

Patient had fully recovered and left the hospital August 22d. "The wound on left cheek is open and will require a plastic operation," are the last words on the hospital record on the day of his dismissal. May 15, 1893, ten months after the operation, word was received at the hospital that "the cancer was returning."

I received several letters from the patient during the six months following his departure, in all of which he maintained that he was well and refused on account of lack of funds to return for the plastic operation. Dr. Liggett wrote me about a year after his return home that there was a recurrence and has since told me that the patient died in 1894, but I could get no further details of the termination of the case.

That this operation, formidable and mutilating as it no doubt was, conferred great benefit upon the patient and prolonged his life, will be admitted by every surgeon. Furthermore, that no "toxins" or "cancer serum" could cause the absorption of bone and cartilage will probably be admitted also by even the most

sanguine and hopeful of the promoters of the serum therapy of malignant tumor.

The International Dental Journal for March, 1896.

"DENTAL ANÆSTHESIA BY CATAPHORESIS," by William H. Rollins, Boston, Mass. Several articles have recently appeared in the dental journals on this subject. They convey the impression that this is a new thing. Now, on the contrary, it is at least thirty years old, for in 1859 Richardson extracted teeth under local anæsthesia produced by driving in medicines by the electric current. Even the use of cocaine, which is specially named in these articles, is old. Any one curious about this matter may turn to my report on dentistry in the *Boston Medical and Surgical Journal* for 1889, where he will find that McGraw used cocaine to produce anæsthesia of the dentine by cataphoresis. In fact, it will be hard at this late date to suggest any new applications of electricity in dental matters, the ground having been gone over too thoroughly.

Even bleaching teeth by electricity, which a recent writer claimed as new, has been in print since 1888. See my report on Dentistry in *Boston Medical and Surgical Journal* for that year, where it is credited to Ames. The treatment of alveolar abscess by electricity is seventeen years old, yet in the latest work on electro-therapeutics, the "International System of Electro-Therapeutics," edited by Bigelow, alveolar abscess is particularly mentioned as not a suitable subject for treatment by electricity. I expect to see the treatment of Rigg's disease and erosion by electricity rediscovered soon, as these methods have had about the usual time which I find it takes new dental ideas to diffuse themselves through the air with sufficient intensity to bring about this result.

As there is no doubt that the time is arriving when dental anæsthesia by cataphoresis will be more used than it has been, I wish to make some suggestions which are the result of long use of this agent. First, I have found by actual experience that the ordinary methods of using the street current are open to serious objections. Two dangers are also present,—risk of a short circuit and risk from return current through the ground.

The ordinary method, which physicians employ in electro-

therapeutics, for reducing the current is a compact resistance on one wire. Turn to any recent work in which resistances are figured, and see how near the binding posts are to each other and how easy it is to cut out the resistance entirely by an instrument falling in contact with them, thus exposing the patient or the operator or both to the full current, which, to say the least, is very unpleasant. Or suppose the resistance is on the neutral main, and as these mains look alike and have no labels on them this may happen, then if the operator touch any one of the several terminals of other circuits which are needed about the modern dental chair, or even if he touch a gas burner, he or his patient or both may get a severe shock. When I first began to use the street current with the ordinary form of resistance I had this experience. To avoid all these and other dangers I arrange my resistance in another way, and do not use a single resistance or a compact resistance which can be easily short circuited. On each main I place thirty lamps each of eight candle-power and in series. These two resistances are placed far apart at the top of the room where there is no possibility of a short circuit. This arrangement I call the minimum multiple resistance. On a hundred and ten volt circuit the maximum current that can pass at short circuit is four milliamperes, which is the greatest current ever needed in dental electro-therapeutics. I also have a rotary resistance of a binary form, both sides being exactly alike and each side connected with one main. This further resistance, which I call the wave-maker, reduces the current to one one-hundredth of a milliampere, but by rotating it the full current which the minimum multiple resistance can transmit may be obtained gradually, or by stopping short of half a revolution any intermediate current may be obtained. With the resistance fixed in this way it is impossible for either the patient or the operator to get a current of greater strength than twice that which he is using, a circumstance of no moment. By rotating this wave-maker by means of a small electric motor I obtain the wave-current for treating the severe cramps of the muscles of the jaws, which make long dental operations so painful to some patients. I do not know who first employed the wave-current in electro-therapeutics, but Kellogg has used it so long that it must be considered old. The point which I wish to make in this paper

is that the periodical literature ought to be more carefully read, for as it is at present every original man, unless he is a really great man, must see his ideas buried for years (unless he patents them), and then credited to some one else. This is always a little discouraging, and deprives the profession of many useful things for a number of years.

The Dental Record for March, 1896.

"HONEYCOMBED AND SYPHILITIC TEETH," by Mr. Heath, read before the Students' Society of the Dental Hospital of London. Teeth present numerous malformations, some congenital, others produced after birth. Of these malformations three are sometimes confused, which it is important to distinguish—those known as honeycombed, rickety, and syphilitic teeth, and it is on these three that I propose to touch this evening.

Under the head of honeycombed teeth we have a variety of irregular forms of tooth-structure. The commonest kind of so-called honeycombing is that in which the surface of the affected tooth presents numerous pits, with irregular yellowish enamel forming a large part of the crown. In the incisors the cutting-edge is sharp and irregular, with the pits sometimes penetrating to the dentine; while molars in a like case usually present, instead of smooth rounded cusps, sharp spinous portions of enamel sticking out abruptly from an irregular honeycombed crown surface. Examined under the microscope the tissues are seen to be deficient in quality, as well as in quantity, the dentinal tubes near the affected surface being irregular, and the enamel porous, with the brown striæ of Retzius well marked. This malformation usually affects like teeth to nearly the same extent; more often than not half the crown of the centrals, about one-third of that of the laterals, the tip of the canines, and the major part of the first molars being the seat of the disease, the bicuspid in these cases escaping. This applies to both the upper and lower jaws. It may happen, however, that only the tips of the centrals are affected, in which case the laterals and canines escape, and the first molars suffer but little. Teeth are often seen with grooves and ridges alternating, sometimes one or two only, occasionally the whole crown presenting a furrowed surface. Also there occur all gradations between the typically honeycombed and the

grooved teeth, any number of rocky, ridged, spinous, and pitted forms being found. This deformity is usually confined to the permanent dentition, though honeycombing of the temporary teeth now and then occurs. The cause appears to be one acting during the time the crowns are calcifying, that is to say, during the first two or three years of life, and evidently also it is a cause that after a time ceases to act, as the later formed portions of enamel are often perfect.

Some diversity of opinion exists as to the cause of honeycombing. The three best known views are the following: (1.) That it is due to the influence of mercury. (2.) That it is caused by convulsions. (3.) That it is the result of the various exanthematous fevers.

The first theory we owe to Mr. Jonathan Hutchinson. He found the lamellar cataract, a disease never present at birth, often attacked children who had suffered from convulsions. He further noticed that a large number of such children had honeycombed teeth, and at first considered the convulsions, cataract, and honeycombing were three results of the same obscure cause. But patients were often seen with lamellar cataract whose teeth were unaffected, and others with honeycombed teeth who had merely suffered from convulsions without lamellar cataract supervening. This seemed to complicate matters until it was noticed that in most of the cases mercury in some form had been administered to combat the convulsions. Here appeared to be a clue to the mystery, and after some careful observation Mr. Hutchinson declared his belief that honeycombing was due to disturbance in the nutrition of the teeth caused by mercury administered in infancy, this malnutrition being brought about either by a definite stomatitis, or simply by the effect of the prolonged presence and influence of mercury in the system. The test teeth for this condition he considered to be the first molars. The usual form in which the drug is exhibited is that of teething powders, the majority of which contain calomel and morphia. One of the chief reasons for the harmful effect of these powders is that, being primarily sedative, the morphia soon induces sleep, which lasts for some hours, during which period the mercury has time to be absorbed into the system, as it is only when the effect of the morphia has passed off, and the child wakes, that the calomel

exercises its aperient action. In support of this theory it is noticed that many persons with honeycombing are unusually susceptible to the effects of mercury, which helps to explain why their teeth have been affected in infancy, when the teeth of others who have been similarly drugged may have escaped. Again, it is extremely difficult in diagnosing a case of honeycombing, apparently idiopathic, to be sure that the child has not had powders secretly administered by a nurse at some time or other to keep it quiet. Many, however, believe that this condition is not caused by mercury, but rather by the convulsions to prevent which the mercury was given; and it is to be remembered that hundreds of those who take plenty of mercury in infancy escape with perfect teeth. While finally there is no doubt that measles, scarlet fever, and the other exanthemata often lead to a malformation of the teeth, especially to the grooved condition already referred to, this being similar to the groove occasionally left on a nail after a temporary illness, it is possible sometimes by careful inquiry to find out that an attack of one of the eruptive fevers took place at the time the part of the tooth affected must have been calcifying. In certain cases, where the health has been alternately decidedly good and bad, the many-grooved condition may result. Other causes of honeycombing are given, such as heredity, inflammation of the preceding temporary teeth, the wrong dieting of infants, disturbance in the circulation by such things as whooping-cough and, finally, rickets.

Mr. Storer Bennett draws a distinction between honeycombed and mercurial teeth, holding that the former present an irregular worm-eaten appearance, while mercurial teeth have the tubercles of the incisors exaggerated, and the cusps of the molars pointed and standing distinctly out.

The *results* of honeycombing are a more than normal liability to caries, with a somewhat increased probability of the setting in of arrest of decay.

The *treatment* consists in smoothing down sharp projections, and filling hollows where possible, though in the case of the first molars a large number will be best treated by extraction, as the teeth cannot be relied upon to resist decay for long, and are of diminished use in mastication, owing to their usually imperfect articulation with each other.

The second class of malformed teeth we mentioned are rickety teeth. In rickety children both permanent and temporary teeth erupt late, and are prone to decay quickly and be lost. They are bluish and smooth, and though the enamel is not apparently defective, it is probably of poor quality. In shape typical rickety teeth are tapering, and often slightly notched.

Lastly, we have to take up the peculiar malformation produced on certain teeth by congenital syphilis. The attention of the profession was first drawn to this subject by Mr. Jonathan Hutchinson. In studying cases of interstitial keratitis, a disease of the cornea, of syphilitic origin usually, Mr. Hutchinson frequently noticed peculiarly shaped teeth which are now known as syphilitic, peg-shaped, or Hutchinson's teeth. If these are found of quite typical shape they are an absolute mark of congenital syphilis, so that it is a matter of extreme importance that they should not be mistaken for other teeth of unusual form.

To begin with the upper central incisors, which are the best teeth, these are often but ill-developed, and are, therefore, seen at a glance to be small and stunted. The form is characteristic, being variously described as barrel or peg-shaped, the important point being that the cutting edge is narrower than the neck of the tooth. This causes gaps between the teeth, and has the effect of making them appear farther apart than they really are.

The colour is dirty grey in bad cases, but is not found if the enamel completely covers the crown, being caused by dentine showing through in places where enamel is absent. The teeth are soft and soon wear down. The central incisors are most often affected, the canines sometimes, the laterals seldom being changed, while the first molars now and then are, presenting a characteristic dome shape, the cusps being represented by rings of enamel quite unlike the sharp spines on a honeycombed or mercurial tooth. The centrals often have their mesial borders inverted and are not always symmetrically affected—one may present the typical shape and its fellow be quite normal. Finally, there is, in the case of the incisors, a mark which often causes simple honeycombed teeth to be mistaken for syphilitic—I refer to a notch in the center of the cutting edge which is not there when the tooth is erupted, being replaced by several small serrated turbecles. Tartar is seldom found around these teeth,

and the additional complication of honeycombing is unusual. Furthermore, the lower incisors are rarely notched or much affected.

The temporary dentition rarely suffers from congenital syphilis, though a case is recorded by Mr. Oakley Coles of a child presenting well-marked syphilitic temporary incisors.

In diagnosing these teeth, especially in noticing the notched condition, care must be taken to distinguish between syphilitic notches and notches due to honeycombing and subsequent wearing away of the cutting edge, or notches due to breakages or the use of a pipe. The last two causes, however, usually produce so symmetrical an appearance that they present little danger. The honeycombed condition, however, may give rise to confusion if the notch is the only character relied upon in forming an opinion. I have a model here of a case in point, of a boy free from any syphilitic taint, with well-marked notches on the upper centrals, due to honeycombing of their tips and wearing down.

Confirmatory symptoms of syphilis should always be obtained in doubtful cases. These are scars radiating from the angle of the mouth, a dusky skin, prominent frontal eminences, and interstitial keratitis. Also ulcers of a distinctly syphilitic origin may help in the decision.

Syphilis usually hastens eruption of the teeth, the temporary incisors being occasionally erupted at birth destitute of roots, but only in a very small percentage of cases does it produce the characteristic malformation we are considering. It is a curious fact that when ulceration of the palate occurs as a result of congenital syphilis the teeth nearly always escape.

It will be well to consider for a moment how the form of the syphilitic incisor is produced. If a newly-erupted normal central be taken it will present three tubercles at its cutting edge, often emphasized by two grooves running longitudinally towards the neck. The crown thus appears to be made up of three denticles. If, during the development of the tooth, the central denticle is stunted and imperfectly developed, especially its first-formed portion, we shall get a falling together of the two outer denticles, producing the typical peg-shaped tooth, while the rudimentary tip of the central denticle will quickly wear away, leaving a notch, and this appears to be a true explanation of the deformity. The

reason the whole tooth is below the normal in size is that syphilis acts upon the tooth continuously from its earliest germ, whereas mercury has a definite action for a defined space of time upon teeth perfect up to birth.

Syphilis acts by disturbing the vascular supply of the pulp, and shows its chief effects upon the dentine, while mercury expends its force on the enamel, and, in cases where syphilis is complicated with mercury, may prevent the formation of the typically syphilitic shape.

The Dental Cosmos for March, 1896.

"TREATMENT OF TEETH AND ROOTS PREPARATORY FOR CROWNING," by J. W. Heckler, D. D. S., Buffalo, N. Y.; read before the Eighth Dist. Dental Society of N. Y. State, Dec. 31, 1895. I have divided the cases to be treated into classes. First. We will take up teeth to be devitalized. I claim that ninety per cent. of teeth to be used for abutments in bridging should be devitalized.

My reasons for this are as follows:—First. It saves the patient an immense amount of pain in grinding the end and sides down. Second. Often the pulp receives enough shock and irritation to produce congestion sufficient to stop circulation. Then death of the pulp is the final result. Third. It is almost out of the question to grind a living tooth to the desired shape. When grinding down a living tooth we grind to the extent the patient permits, not always as we want it. Hence my recommendation to devitalize for anchorage in bridge-work.

The operation of devitalization can be done in an almost painless way by drilling only through the enamel-wall, making the application of arsenious acid next to the dentine, and sealing it over with wax. I do this by placing a small bit of wax in the cavity and over the arsenious acid, heating a blunt instrument and thrusting it into the wax, when it will be melted and adhere to the walls, and hermetically seal it in place. I leave this application in from one to three days to suit the convenience of myself and patient, when it will be found that the pulp-chamber can be opened with very little or no pain.

After the first application of arsenious acid the operator is enabled to grind the tooth to any extent he may desire to fit the band for the crown, when he can take the impression of the case

and go on making the crown while the roots are getting into proper condition for filling.

Often this one application is found ample for the destruction of the pulp; but if, according to the operator's judgment, it is not, make the second application directly to the pulp, seal it over as in the first instance, and leave as long as your judgment dictates,—say from twelve to twenty-four hours,—when I am quite sure the pulp can be removed without pain.

After the thorough removal of the pulp and fragments comes the medicinal treatment. For such treatment I recommend washing out the chamber and canals with absolute alcohol; this accomplishes two very important things. First. It washes out the remaining fragments and blood-clots, and tends to act as an astringent, stopping the oozing of blood-serum from the foramen.

Second. Alcohol, having a great affinity for water, absorbs the water in the canals, and by evaporating it leaves the walls in a perfectly dry condition, a condition desired by those who believe in immediate root-filling, but in a condition I desire for further treatment. For this I recommend and use nothing but the essential oils, such as the oils of cassia, eucalyptus, etc., probably more of the cassia on account of its pleasant taste and odor as compared with the others, except in cases of front teeth, when I desire to retain the original color. The oil of cassia is liable to discolor slightly. I make this dressing by saturating a shred of cotton with the oil and carrying it to the bottom of the canal with a smooth broach.

It might be well to tell how to make a perfectly smooth broach, one that will not pull the cotton out after it is carried to place, as I deem it important that the dressing should be packed against the apex. I take an old broach or piece of piano-wire the desired length, put two sand-paper disks, grit side together, in the mandrel, and place the broach between them, and grind it to as fine a point as I like, finishing with cuttle-fish disks.

Getting back to the subject again. The dressing I leave in from twelve to twenty-four hours, and even longer. At the next engagement I invariably fill the roots, deeming further treatment unnecessary. On this occasion it is highly essential to adjust the rubber-dam, especially for filling the roots of the inferior teeth. After the dam has been adjusted so as to keep out all saliva, then

—and not till then—remove the dressing from the roots and wash again with alcohol, and evaporate it with hot air from the chip-blower, or, better yet, a hot-air syringe. After the thorough evaporation of the alcohol, the roots should again be wiped out with essential oil, and forced by heated air into the body of the tooth. It has been proven by Dr. Harlan and others that the oil penetrates every portion of the tooth-structure save the enamel.

Stop for a moment to see what takes place when we remove the pulp from its bony abode with its numerous attachments. We have a great amount of tearing of tissues, as you know the odontoblasts form the skin of the pulp, and their wavy tails penetrate the dentine through the tubuli and anastomose very freely on the periphery. This being a fact, it is readily seen that some of the odontoblasts are left clinging to the walls of the pulp-chamber and root-canals, while some of them are pulled out, as it were, by the roots. The question now arises, what is to be done with these odontoblasts that are left on the walls and the fibrilli in the tubuli?

The treatment is that which I have described. It extracts its watery portion and embalms the animal. Next, by bathing the walls with essential oil before pumping chloro-percha into the canal, it promotes capillary attraction and prevents the chloro-percha from hardening and rolling up and not adhering to the walls. This being done, we are ready to insert the keystone,—the gutta-percha cone. This I do by heating a blunt instrument of the required size, sticking it into the base of the cone, and allowing it to cool and harden before pressing the cone home. I force this cone in as far as possible, absorbing with bibulous paper the fluid portion that has been forced out by the cone, and soften that portion of the cone which remains above the mouth of the canal by hot air and force it into the root with a blunt instrument about the size of the opening. Then I take a bur of a fair size and shave off the surplus gutta-percha, leaving the root entirely corked up.

Next we will consider teeth and roots with dead pulps. In these cases too much care cannot be used in handling. Nothing short of years of experience will enable the operator to thoroughly master them, as almost every case has to be treated differently, but there can be some general rules laid down by which we may be governed.

The first treatment should be the chiseling and burring away sufficiently to admit of perfect and free access to the root-canals. Sometimes we find it exceedingly difficult to gain entrance to these canals, but if you bore out a little at the mouth you will cut through a small stricture, when entrance will be gained without further trouble.

On gaining an entrance, one should use only the finest pulp-canal cleanser, as a large one would prove too much of a piston. Do not attempt to remove any of the putrescent pulp by wiping the canal with cotton on a broach, as nothing could be worse. The operator can, by careful manipulation, pass down between the pulp and the walls of the canal.

After the pulp has been removed I use a dressing of cotton, packed very loosely, saturated with a solution of bichlorid of mercury, 1-1000 or 1-1500, and leave this dressing in from twelve to twenty-four hours, unless a complication arises from some of the pulp being pushed through the apical foramen, when it will be necessary to remove all dressing to give free vent. Sometimes we have trouble from gases forming, also the accumulation of serum caused by the enlarged and congested capillaries, when it is necessary to apply counter-irritants.

In either of the above cases it might be well to pack the cotton so loosely that the canal acts only as a drainage-tube. After the complications have been controlled I find by experience two treatments to be ample.

For the first, use the cotton dressing saturated with bichlorid. This drug destroys the life of the germs, and at the same time tends to render them inert matter. I know of only one objection to the use of bichlorid: it is a slight coagulant, but I believe this can be partly if not wholly overcome by the addition of acetic acid.

For the second, use the dressing of essential oil and fill the roots in the foregoing manner.

I would like to discourage the use of some drugs in the treatment of pathological cases, especially the use of carbolic acid or any of the escharotics after devitalization, pyrozone, or any drug that is an effervescent. Carbolic acid only coagulates the albuminous fragments left in the pulp-canals, and is something that should be avoided; if it is used as a germicide it only coagulates

his coat and probably keeps him in a dormant state until such time as the condition and surroundings are favorable, when he will again put forth new life and be as mischievous as ever; besides, it is extremely difficult to use carbolic acid without burning the patient's mouth more or less. Pyrozone or any drug that effervesces should not be used in a putrescent case or blind abscess.

Gases expand equally in all directions. By pumping an effervescent into a root-canal partially filled with a putrescent pulp, expansion takes place immediately, and some of the putrid matter is forced through the apical foramen by pressure of the piston used to insert the pyrozone.

If there should be a serous sac partially filled with pus on the end of the root, and should the operator pump a sufficient quantity through this sac, he will cause the patient more pain than he is likely to get forgiveness for in this world.

THE PENETRATION OF MICROBES INTO THE BLOOD.—M. Nocard reported at a recent meeting of the Society of Biology, Paris, experiments by which he has been able to demonstrate that microbes are capable of entering the blood through the alimentary canal. He found that, while the blood is usually sterile after an ordinary meal, a few microbes being found in the blood, after a meal containing a considerable quantity of fat, microbes were found very abundant. His theory is that microbes are conveyed into the blood by the small fat globules, which are taken up by the lacteals.—*Druggists' Circular*.

THE DIET OF CHILDREN.—Soft-boiled eggs are as nutritious as any meat, and far more acceptable to young stomachs. Eggs and apples were the beginning and end of a Roman dinner in the good old frugal times of the republican era, and together with brown bread and a cup of fresh milk should form the principal ingredients of a schoolboy's fare. The word "apple" may, however, be taken as a generic term for any kind of ripe, palatable fruit, as "bread" for any sort of farinaceous preparation. Zenophon, in the chatty chronicle of his Asiatic Campaigns, mentions a tribe of Bithynian hill-dwellers, whose children were "as thick almost as they were long," and explains that the youngsters were fed on boiled chestnuts. Cornbread, with an admixture of fat, often achieves results which arrowroot specialists cannot hope to approach, and a Boston patriot was perhaps right in tracing certain triumphs of physical education to the favorite dish of his native town. Baked beans, instead of oatmeal porridge, and pears, peaches, and grapes as an alternative of baked apples, may forestall the complaint of monotony, till the youngster has reached the age of confirmed dietetic habits, which often precedes the term of his college education by half-a-dozen years.—*The Child-Study Monthly*.

Letters.

NEW YORK LETTER.

NEW YORK, April 18, 1896.

To the Editor of the Digest,

DEAR DOCTOR:—Again, Pyorrhea Alveolaris, yes and more coming at the May meeting of New York State. Prof. Peirce is gouty still. Dr. — suggests it may be the pulp, but Dr. Burchard says not. He says something else to which we can listen with profit, viz., that the articulative tissues of the teeth, because this happens to be the weak point, a *locus minoris resistentiae*, have so much of the "resistibility" that you see none of the weak points, and they go through all the scourges untouched to old age.

Some things ought to be italicized and kept in mind as pointers; first is mal-nutrition, this admits of a lesion, for without it none could occur; next, the *locus minoris resistentiae*; next, thoroughness in removing deposits, that was emphasized by the first and has led to the modern attention to this disorder. No doubt we all agree with Dr. Younger, that the essential thing is to remove all deposits.

Dr. Talbot raises the possibility of doubt whether or not they are irritating, which seems a little funny. Dr. Truman emphasizes "his treatment that he gave to the profession long ago," which is, essentially, the use of sulphate of quinine. While it is an astringent and may act upon the gum tissues, to our mind it is constitutional treatment direct, the system gets the tonic effect and we believe that is the true value of its use.

Dr. Burchard says one thing which we desire to notice—simply removing calcareous deposits does not cure the disease, nor does constitutional treatment, they simply make the arrest more secure. Dr. Truman says he cured a case in his mouth, and that it will never come back. The history and treatment would add much in these days of investigation.

It will be watched with much interest how Dr. Williams will cover Prof. Heitzman's invented or applied theory that the ameloblasts break up into "embryonal corpuscles." Williams

says, "It would be plausible if it had any foundation in fact." Will that (thrust) be parried? Dr. Williams is a man from Maine, the home of the "Plumed Knight." Well, this fight is all over the cadaver, but it is arousing a decidedly fresh interest, for books have been written. Oh! that all the enemies would write a book. The late Dr. Atkinson always rejoiced "that he never did write a book."

The First District Society has taken Hart again for another year with his former associates. The Dwinelle clinic will demonstrate bleaching by cataphoresis; something *new* in the treatment of phorria; and anesthesia of the lower lip following treatment of chronic abscess.

The Odontological Society will be favored with "Mistakes," by S. G. Perry, and it will be a mistake if he does not interest, according to his usual custom. Our mistakes are the best things that come to us, if we see a lesson of profit by them.

Special, for the 24th, at the Academy of Medicine, Prof. Morton, of the New York Post Graduate School, will give, under the auspices of the Odontological, a lecture on "The X Ray and its Application in Dentistry," demonstrated with apparatus and lantern slides. This is a forward move for a dental society, but why not? It is a popular move for emphasizing dentistry. The "X" Committee has Walker on it this year and it has rais(ed) a great many interesting things.

Mr. R. S. Williams died Wednesday night of this week from heart failure, caused by overwork. He was a very worthy man and had the respect of all those with whom he came in contact.

Everything is big in New York, and nothing more so than "Greater New York." Ice has gone up here and the mercury is racing after it—result, great heat in April, with indications of a dry season, consequently, great depression of spirits.

Cordially, NEW YORK.

IODINE AS AN ANTISEPTIC.—At a meeting of the German Naturalists and Physicians, Herr Soeb, of Aix-la-Chapelle, read a paper in which he alluded to two classes of iodine preparations. Most of those in use belong to the first, in which free iodine is given off in the system and iodoform poisoning is caused in this way. Nosophen belongs to the second class; it forms with albumen an iodine combination which has a bactericidal action, and is again decomposed, leaving the system in its original form.—*Brit. Jour. Dent. Sc.*

The Dental Digest.

PUBLISHED THE

TWENTIETH DAY OF EVERY MONTH.

Editorial.

THE RECENT DISCUSSIONS ON PYORRHOEA ALVEOLARIS.

Looking for light on this unconquered and, as yet, not understood disease, we have been more confused than enlightened. The most of the papers thus far read and discussed throw but little light on the subject, and we should say had generally a tendency to confuse the reader, rather than to help him. The prominent point in most of them seems to be an attempt to show that the uric acid theory is incorrect. To an honest observer, looking for aid on the subject, there is much to bewilder and little to assist. For instance, take the discussion of Dr. Talbot's paper, read before the Academy of Stomatology, at Philadelphia. There were about as many theories and methods of treatment as speakers; pyorrhoea could be cured by removing the deposit or by not removing; some claimed that nearly all cases could be cured, others that there was no cure except the forceps.

The question arises, how far are we justified in assuring a patient suffering from the disease that his case is curable? If the tooth is comparatively firm in the socket, we should say it is fair to entertain a reasonable hope of preserving it for some time with proper treatment. But when a case presents itself where pressure on the grinding or cutting edge of the tooth forces it some distance back into the socket, and upon removal of pressure the tooth drops back again, there is no living person who can cure such a case. In these cases, we might say invariably, the end of the root is denuded of periosteum. Even where such teeth can be made absolutely free from deposits and held firmly by metal bands, their loss is sure to follow, and they are even less likely to be retained by tying with silk ligatures and attempting to hold

in place until new bony tissue can form around them. Therefore, treatment of such cases is only a torture and useless expense to the patient and a waste of time to the operator, who should be able to employ his time in a more useful way.

In the treatment of hopeful cases they will improve or retrograde as the patient's physical condition changes, and we should say that constitutional treatment should accompany local.

There is another class of hopeless cases, where a deposit forms on the roots without any destruction or disturbance of the tissue around the neck of the tooth. This occurs many times near the ends of the roots of molar teeth, and sometimes between the roots. We have had a few such cases, the suffering being intense, and the only relief lay in the forceps. We are aware that some writers deny the existence of this form of the disease, they not having noticed it, but this is all the worse for their observation, as there can be no doubt that this form exists, and it is, in our opinion, the worst phase of the trouble.

THE DECISION OF THE COURT IN THE LOW BRIDGE PATENT CASE.

We publish in full below the decision given by Judge Wheeler in this case. It will be seen that the decision is quite brief, and we understand that his custom is to pick out the main points in the evidence and not go much into the details. The two prominent points are, that the invention was not patentable, as the method was wholly mechanical, and, that it had been used before it was patented. There were several other points at issue which are not discussed, such as the file wrapper contents and the title.

UNITED STATES DISTRICT COURT, EASTERN DISTRICT OF NEW
YORK.

INTERNATIONAL TOOTH CROWN CO.	} In Equity.
vs.	
ALLEN G. BENNETT.	

The bill alleges ownership by the plaintiff and infringement by the defendant of patent No. 238,940, dated March 15, 1881, and granted to James E. Low for a method of permanently fixing artificial teeth to the mouth by bands around the natural teeth, in

dentistry. The answer among other things denies knowledge, and prays strict proof of ownership; and sets up various anticipations.

At one place a certified copy from the record of an assignment in the patent office was put in evidence taken on notice, but in absence of defendant's counsel. This is objected to now as insufficient. It would have been inadmissible on objection then; and perhaps have been suppressed on motion afterwards. *American Cable Railway Co. vs New York*, 60 Fed. Rep. 1016. But as it has been left as evidence in the case its inadmissibility has been waived, and on that waiver it seems to be sufficient.

The patent was before Wallace, and Shipman, J. J., *International Tooth Crown Co. vs Richmond*, in the circuit court for the District of Connecticut, 30 Fed. Rep. 775, and sustained. Of course everything decided there is to be considered as settled here.

The method is wholly mechanical, and is said now, in view of *Ridson vs. Medart*, 158 U. S. 68 decided since, not to be patentable; and defenses of prior knowledge and use by Doctor Day and by Doctor Beardsley, not before the court then, are relied upon now.

When the method, and not the operating parts, is what is invented, that, of course, is what is to be patented. Here the natural teeth belong to the wearer, and are to be operated upon; they are not made by the inventor to operate and cannot be brought within the patent. The bands were not new in any sense alone; nor were they when combined with the artificial teeth merely; but the mode of attaching the artificial to the natural teeth permanently by the bands might have been; and if so, that was what was invented and what should be patented.

This method is thus described in the specifications:

"A band of gold or other suitable metal is first prepared and accurately fitted around the tooth adjacent to the vacant spaces to be supplied with an artificial tooth. This band is firmly secured in place by cement, which effectually excludes water or the fluids of the mouth, and is thus permanently attached to the tooth, so that it cannot be removed without an operation directly for that purpose. It is sometimes sufficient to prepare one of the adjacent teeth in this way; but generally it is desirable to prepare the ad-

jacent teeth on each side of the vacant space. It will always be advisable to do so if the vacant place is to be occupied with more than one tooth."

"The formation of the mouth and the shapes and position of the teeth are so various with different individuals that my invention may require modification in various particulars in applying it. I therefore do not propose to limit myself to the details as shown, but consider that my invention includes the permanent attachment of artificial teeth by securing them to continuous bands permanently attached to adjoining teeth supported upon natural roots, and supporting said artificial teeth by said attachments without dependence upon the gum beneath said artificial teeth."

The claims are for:

"1. The herein-described method of inserting and supporting artificial teeth, which consists in attaching said artificial teeth to continuous bands fitted and cemented to the adjoining permanent teeth, whereby said artificial teeth are supported by said permanent teeth without dependence upon the gum beneath.

2. An artificial tooth cut away at the back, so as not to present any contact with the gum except along its front lower edge, and supported by rigid attachment to one or more adjoining permanent teeth, substantially as and for the purpose set forth."

This method, as such, would be as well practiced and shown by the attachment in that way of one side of one tooth or one end of a block of teeth, to one natural tooth, as by so attaching each side of the single artificial tooth, or each side of the block to a natural tooth. The method of the attachment to a natural tooth is, by the terms of the patent, precisely the same. A band extending upwards so as to form a cap over the natural tooth would be none the less a continuing band of the patent when used as such in carrying out this method. The alleged infringement was done only by such use of such a cap. Doctor Day testifies to soldering a silver cusp to a silver band, making a cap, which was permanently attached to a natural tooth of a patient, and to which an artificial tooth was attached. This testimony is supported by that of an assistant learning the profession; that of an intimate acquaintance of the patient, and the production in evidence of the work, kept after long wear.

Doctor Beardsley testifies to making a similar cap of gold and attaching it to a natural tooth of a patient, wife of a clergyman, and to attaching at first an artificial tooth at one side of the cap, and afterwards another on the other side, which were worn, and gave satisfaction, several years. In this he is corroborated by an assistant, also learning the profession, and by the patient, her two daughters, and one of her Sunday-school scholars. There is nothing so improbable about this testimony, which is left wholly undisputed, as to leave any fair doubt as to the occurrences, or their date, both of which preceded Low's invention. The method of either seems to be the method of the patent, and either seems to have well anticipated it.

Let a decree be entered dismissing the bill.

HOYT H. WHEELER.

JAMES C. CHAPIN, }
EDWIN H. BROWN, } for plaintiff.

CHARLES K. OFFIELD, for defendant.

Notices.

SOUTH DAKOTA BOARD DENTAL EXAMINERS.

The South Dakota State Board of Dental Examiners will meet Wednesday, June 3, 1896, at the Cataract House, Sioux Falls, for the examination of candidates for licenses, and for the transaction of other business.

W. H. H. BROWN, Sec'y.

SOUTH DAKOTA STATE DENTAL SOCIETY.

The South Dakota State Dental Society will meet at Sioux Falls, S. D., on the first Wednesday in June, 1896.

The State Board of Examiners will also meet at the same time and place.
Dr. F. E. FIELD, Acting Sec'y.

THE CHICAGO DENTAL SOCIETY.

The following officers for 1896-97 were elected at the annual meeting, April 7th, 1896,—Pres., Louis Ottoby; First Vice Pres., J. E. Hinkins; Second Vice Pres., H. A. Costner; Rec. Sec'y., A. H. Peck; Cor. Sec'y., Geo. B. Perry; Treas., E. D. Swain; Librarian, H. A. Gunther; Member Board of Directors, G. H. Cushing; Board of Censors, G. T. Carpenter, B. D. Wikoff, G. W. Schwartz.

THE TEXAS DENTAL ASSOCIATION.

This association will hold its annual meeting this year in Waco. The session convenes Tuesday, May 12th, and continues three days. Realizing the

importance of practical demonstrations, the Association has always striven to make this feature prominent, and especial effort has been made this year in that direction. A committee on clinics, appointed at the last meeting, has secured a large number of clinicians, who will be ready to demonstrate almost everything of interest to the profession. In addition to this, a number of papers have been promised. Furthermore, it is expected that the presence of several practitioners of note outside the state will be secured, so that altogether the meeting will prove one of unusual interest. It is earnestly desired that every legal practitioner in the State, who holds his profession in sufficient esteem to aid in its advancement, will attend this meeting and unite with us in its upbuilding.

J. G. FIFE, Sec'y., Dallas, Texas.

OHIO COLLEGE OF DENTAL SURGERY.

The memorial exercises to Dr. James Taylor, founder of the College, were held April 16th, 1896, at the fiftieth anniversary of the Ohio College of Dental Surgery. The program:—Music; Invocation, Rev. A. A. C. Taylor; Address, Dr. A. W. Harlan, for the Alumni Association; Address, Dr. Jas. J. Taylor, for the Board of Trustees; Address, Dr. Jonathan Taft; Music; Address, Dr. P. S. Cassidy, for the Faculty; Voluntary Remarks; Music.

CHICAGO COLLEGE OF DENTAL SURGERY.

The fourteenth annual commencement was held Tuesday, April 7th, 1896, at the Schiller Theatre, Chicago. The program was:—Music; Invocation, Wm. M. Lawrence, D. D.; Music; Annual Report, Dr. A. W. Harlan, Secretary; Music; Conferring of Degrees, Dr. Truman W. Brophy, President of the College; Music; Class Valedictory, Dr. W. H. G. Logan; Music; Doctorate Address, Dr. C. N. Johnson; Music; Address, John J. Halsey, M. A., Acting President of the University.

News Summary.

TO KEEP THE HANDS CLEAN.—In the warm days that are now before us, when a rubber glove cannot be worn with comfort while engaged in prosthetic work, an anointment of honey for the hands will subserve the same purpose. It holds the dirt in suspension and dissolves very quickly when immersed in water, leaving the hands soft and clean.

Take clarified honey and rose-water, of each one pint, Listerine two ounces. Mix and bottle. For winter use, add two or three ounces of glycerine.

GIGANTIC TOOTHACHE POSSIBILITIES.—The tooth of a mastodon, in an almost complete state of preservation, has been recently unearthed. The mastodon must have been sixteen feet high and thirty feet long, and, if a male, its tusks must have been from eleven to twelve feet long, and from the appearance of the tooth an extremely old animal, probably 150 years of age. The tooth weighed 14 lbs. 12 oz., and measured ten inches by six, and is of the

purest ivory. It was worn down to the quick with the nerve exposed, and a naturalist to whom it was given was of the opinion that the animal must have suffered untold agony for years from toothache.—*Brit. Jour. Dent. Sc.*

THE NOSE AS A MICROBE DESTROYER.—According to some recent experiments there are in each particular pint of air which the adult takes in with inspiration about 15,000 microbes. In some localities, to be sure, this number reaches up to the million, but the average city number is about as stated. This microbe-laden air is taken into the air passages. When the air is thrown out it is quite sterile. The air has further been found to be sterile in the nasopharyngeal cavity. The inference is, therefore, that the nose is a most powerful microbe destroyer, and also that, in order to destroy the individual 15,000 microbes, it is important to draw the air through the nasal passages.—*Medical Record.*

CAUSES OF DEATHS.—According to the census of 1890 (*Maryland Medical Journal*, Aug. 17, 1895), of every 10,000 deaths in the United States 1 will be from calculus, 35 due to Bright's disease, 40 to fevers other than typhoid, 59 to rheumatism, 70 to scrofula, 130 to cancer, 140 to apoplexy, 148 to whooping cough, 160 to dysentery, 190 to meningitis, 220 to scarlatina, 246 to ague, 250 to convulsions, 310 to typhoid fever, 350 to heart trouble, 480 to diphtheria, 880 to diarrhea, and 1422 to phthisis. Of this number 2210 are from typhoid, diphtheria and phthisis, all of which are preventable, and if we take in whooping cough, dysentery, scarlet fever and diarrhea, we shall have more than one-third of all deaths at the present time from preventable causes.

ADENOID VEGETATIONS OF THE NASO-PHARYNX.—Arslau, of Padua, concluded, after extended clinical study, that adenoid vegetations of the naso-pharynx occur frequently in Italy. The primary causes are heredity and dyscrasic diseases, the secondary causes humidity and infectious processes. He employs the Moritz-Schmidt incision, followed by scraping with the finger. As an anæsthetic he finds ethyl bromide preferable. In all cases where adenoid vegetation is detected it should be removed, and all children should be subjected to a naso-pharyngeal examination before being admitted to public or private schools or other institutions.—*Ann. d. L'alad. de l' Oreille, du Larynx*, etc., 1895, No. 10.

SOME GENERAL STATISTICS.—The 72 races inhabiting the world communicate with each other in 3,004 different tongues, and confess to about 1,000 religions. The number of men and women is very nearly equal, the average longevity of both sexes being only thirty-eight years, about one-third of the population dying before the age of seventeen. Moreover, according to the most careful computation, only 1 person in 100,000 of both sexes attains the age of one hundred years, and only 6 to 7 in 100 the age of sixty. The total population of the earth is estimated at about 1,200 million souls, of whom 35,214,000 die annually—i. e., an average of 98,848 a day, 4,020 an hour, and 67 a minute.

The annual number of births, on the other hand, is estimated at 36,792,000—*i. e.*, an average of 100,800 a day, 4,200 an hour, and 70 a minute.

Generally, taking the entire world, married people live longer than single, and those who have to work hard for their living longer than those who do not, while also the average rate of longevity is higher among civilized than uncivilized races. Further, people of large physique live longer than those of small, but those of middle size beat both.—*Medical Record*.

A CURIOUS ACCIDENT.—A "broken nose" is not an uncommon occurrence, but that the whole upper jaw should be separated from skull is worthy of record. Mr. Hopkins reports a case admitted into the Swansea Hospital. A man, aged forty-nine, was struck by a wooden beam on the back of the head; he was knocked forward against a coal-truck, so that the edge caught him at the root of the nose. The nasal and zygomatic processes were fractured, the superior maxillary bones were detached, and there was separation in the middle line of more than an inch. The frontal sinus and anterior ethmoidal cells were opened up, but the eyes were quite uninjured. The parts were kept in very good position by using Smith's gag, which was worn continuously for a fortnight.—*Brit. Jour. Dent. Sc.*

SHOULD ONE SLEEP AFTER EATING?—We would not now revert to this oft-discussed question to give any one's theoretical views or personal beliefs in the matter, or to bring forward the familiar argument that because animals sleep just after they have eaten, hence the human animal should do the same. Dr. Schule, of Fribourg (*La Med. Mod.*, January 15, 1896), has, however, approached the subject from the chemico-experimental side and his results are worthy of record. Having analyzed the stomach's contents in two normal subjects a few hours after meals, some of which were followed by sleep and others not, he finds that sleep has for its constant effect the weakening of the stomach's motility and at the same time there is an increase in the acidity of the gastric juice. On the other hand, simple repose in the horizontal position stimulates the motive function of the stomach but does not increase the acidity of the gastric juice. The conclusion is hence reached that, while one should stretch himself out for a rest in the horizontal decubitus after a hearty meal, he should resist the tempting Morpheus, especially if there be present a dilated state of the stomach or if its juices be hyperacid.—*Medical Record*.

Obituary.

RESOLUTIONS BY THE NEW YORK ODONTOLOGICAL SOCIETY.

The rapid years have gathered one more of the great men of our profession to his final rest.

Dr. Wm. H. Dwinelle, whose life we commemorate, and whose death we mourn, was one of the great figures in the early days of our young profession.

He was born in Cazenovia, N. Y., where he died at the Homestead on Feb. 13, 1896, 76 years of age.

Entering our profession at a time when it was struggling for recognition among the learned professions, he brought to it the influence of a remarkable personality, and through his varied attainments, and by his energy and hopeful confidence he helped, as few others did, to place it upon a secure foundation among the learned and liberal professions of the world.

Fitted for the practice of medicine and surgery, he yet saw in the specialty of dentistry a wider field for the exercise of his peculiar genius, and he entered upon his work with boundless enthusiasm. This is shown by his numerous inventions, his brilliant operations, and his contributions to the professional literature of his time. It is also warmly attested by the few surviving companions of those early days.

He assisted in the formation of the first Dental College, and was instrumental in establishing the *American Journal of Dental Science*—one of the most dignified and influential journals our profession has produced.

He performed surgical operations in the oral cavity that were the admiration of the general surgeons of the day, and he performed operations upon the teeth that had never been before attempted. Many examples of his work are still in existence to testify to his remarkable ingenuity and to his unusual skill.

A man of warm heart and generous impulses, he freely gave to all who came; his office was always open, and he was ever ready to show his instruments and his methods to any one who desired to learn.

Having practiced medicine and surgery before he entered the dental profession, he commanded the confidence of physicians and surgeons, and was thereby able to help in an unusual degree to secure recognition for our specialty, and he stood for many years as a bond between the parent profession and its young offspring.

A man of literary tastes and a devoted lover of art in all its forms, he was able to reflect credit upon our profession at a time when such influences were more needed than at present.

A man of tender sensibilities, he was a genial companion, and his wide sympathies and varied talents made him a great favorite among cultured people.

He was a man of so many gifts that he could have been a poet, an actor, an artist, a sculptor, or a literateur; this wide range of talent made him always an agreeable friend.

Before the bar he would have been a great advocate; in the medical profession he would have been a great physician or a great surgeon.

He chose to be a great dentist.

For this we honor his memory, and we think it fitting that this Society, once presided over by him, should place on record its appreciation of him while living and its sorrow for his death.

A. R. STARR,
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